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THE SELECTION OF PATIENTS FOR MITRAL VALVOTOMY.[1]

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Any patient with chronic rheumatic heart disease may be considered suitable for mitral valvotomy if the disability results mainly from mitral stenosis and is sufficient to justify the risks of operation. This general statement implies that operation is a primary part of the treatment of mitral stenosis and not the last resort of a failed medical regimen. The physician's problem is twofold: to determine the true nature and extent of the patient's disability, and to determine the degree to which this results from obstruction to mitral blood flow. The answers to these questions can usually be obtained by clinical methods—that is, from the history and physical examination—and rarely will other forms of investigation, except electrocardiography and fluoroscopy, be required. This paper is largely concerned with these clinical methods. A brief account of the hæmodynamic aspects of the problem will be given, for it is upon these that our present clinical approach is based. The views expressed are founded on personal observations on 90 patients operated on for mitral stenosis who were

studied preoperatively and in some cases after operation by cardiac catheterization and by direct hæmodynamic observations at operation as well as by clinical methods.[1]

Hæmodynamic Aspects of Mitral Stenosis.

The physical factors which determine the pressure flow relationships across the mitral valve are very complex; an excellent discussion of this problem will be found in a paper by Gorlin and Gorlin (1951). However, from the physician's point of view an application of the simple Poiseuille formula will suffice. As the mitral valve narrows, its resistance to flow increases, so that a greater pressure is required in the left auricle to maintain a steady flow rate. Figure I shows the manner in which the left auricular pressure varies with varying flow rate and varying mitral valve area. Much of the clinical course of patients with mitral stenosis can be explained by considering the implications of this figure. The rate of flow across the mitral valve is expressed in cubic centimetres per diastolic second. This is done because the flow occurs only in the diastolic period of each heart cycle. The diastolic period in a heart cycle is readily measured from a brachial artery pulse tracing, and when it is multiplied by the pulse rate the total diastolic filling interval per minute is obtained. The cardiac output per minute divided by the

diastolic filling interval in seconds gives the flow per diastolic second.

The term "pulmonary capillary pressure" refers to the pressure obtained by wedging the tip of a cardiac catheter into the distal part of a pulmonary artery so as to block completely the forward flow along that vessel. Under certain circumstances the pressure so recorded is that transmitted back from the left auricle to the pulmonary capillaries. This pressure corresponds closely to the true left auricular pressure (Lagerlöf and Werkö, 1949; Epps et alii, 1953). In normal hearts and in pure mitral stenosis the pressure in the left ventricle while the mitral valve is open (that is, in diastole) is small, about five millimetres of mercury, and can be disregarded. It cannot be disregarded, however, if there is some additional lesion such as aortic valve disease, mitral incompetence, hypertension or active rheumatic carditis which may cause the left ventricle to fail and thus its diastolic pressure to rise.

From Figure I it is seen that even when the mitral valve is diseased, an adequate flow across it for ordinary needs

RELATION OF MITRAL VALVE AREA TO VALVE FLOW AND PULMONARY CAPILLARY PRESSURE

Pulmonary Capillary Pressure - mm. Hg

FIGURE I.

Relation of mitral flow to the pressure gradient and valve area. Pulmonary "capillary" pressure is taken to equal left auricular pressure. The flow rate is expressed as cubic centimetres per diastolic second in order to correct for the effect of heart rate in altering the time available for mitral flow (see text). The curved lines represent theoretical pressure-flow curves for given mitral valve areas. The dots are actual observed values for pressure and flow in patients in whom the mitral valve area was determined at autopsy or at operation. (Reproduced from Gorlin, R., and Gorlin, S. G., 1951, by courtesy of C. V. Mosby Company.)

can be achieved without an undue rise in left auricular pressure, provided the valve area is still greater than about two square centimetres. Such patients may have no symptoms except with extreme exertion. However, as the area of the valve decreases below this figure, an ever-increasing rise in left auricular pressure is required to produce even moderate increases in flow rate above a resting level of about 100 cubic centimetres per diastolic second. This increase in left auricular pressure, which is accompanied by an equal increase in pressure in the pulmonary veins and capillaries, is the basis for effort dyspnœa, the main symptom in patients with mitral stenosis.

Usually when symptoms are severe, the mitral valve area is found at operation or at autopsy to be reduced to about one square centimetre or less. It can be seen from Figure I that in this situation even small increases in mitral valve flow can be produced only by great increases in left auricular pressure. When the latter rises to more than about 35 millimetres of mercury, the hydrostatic pressure in the pulmonary capillaries exceeds the colloid osmotic pressure of the plasma proteins, and pulmonary œdema occurs. Thus, in patients with severe mitral stenosis, the "pulmonary capillary" pressure will be found to be high at rest and the cardiac output low, and with mild effort the pressure rises even higher with little or no increase in cardiac output.

The effect of heart rate upon the pressure-flow relationship in severe mitral stenosis requires emphasis for practical reasons. As the heart rate increases, the length of the diastolic period in each cycle decreases more than the systolic. An increase in pulse rate from 80 to 140 per minute may decrease the total diastolic interval by twelve seconds per minute. Thus, if the same volume of flow per minute is to be maintained, the flow rate must be considerably increased and the left auricular pressure must rise. That tachycardia alone is inimical to patients with mitral stenosis is a fact well known to generations of physicians, who have used digitalis to slow the pulse when this was unduly raised by auricular fibrillation. By the same token atropine and its derivatives are potentially dangerous to patients with mitral stenosis in sinus rhythm because of the tachycardia they produce. It is especially important to avoid their use in pre-operative preparation. Occasionally atropine is given to patients in pulmonary œdema in the hope that pulmonary "secretions" may be reduced. This can be lethal.

Consequent upon the rise in pressure in the left auricle in patients with mitral stenosis there is a rise in pressure in the pulmonary artery in order to maintain the necessary gradient for flow through the lungs. However, not infrequently there is a greater increase than can be explained by a passive concept. In such cases there is an increase in the actual resistance to flow through the pulmonary arterioles, owing either to organic obliterative changes in these vessels (Parker and Weiss, 1936; Larrabee et alii, 1949) or to arteriolar hypertonus. The consequences of this pulmonary hypertension are the same as those of systemic hypertension—notably dilatation, hypertrophy and ultimately failure of the right ventricle. Moreover, this pulmonary hypertension may become irreversible, whereupon relieving the mitral stenosis by valvotomy will not materially alter the outcome of the disease.

This outline of the hæmodynamic effects of mitral stenosis is necessarily brief and incomplete. It will be closed by the statement that mechanical factors alone will not explain the course in every patient with rheumatic heart disease, just as the course of patients with mechanical strain of the left ventricle due to systemic hypertension cannot be ascribed entirely to the degree of strain as judged by the level of the hypertension. Thus, according presumably to the "quality" of the myocardium, a high pulmonary artery pressure may be tolerated for years without signs of right ventricular failure, while congestive cardiac failure occurs sometimes in patients with rheumatic heart disease who have neither severe obstruction to mitral blood flow nor greatly increased pulmonary resistance.

The Assessment of Symptoms.

Lassitude.

Most patients with chronic rheumatic heart disease complain of tiredness or easy fatigability. Sometimes this symptom, and not dyspnœa, dominates the clinical picture. It has been suggested that this occurs particularly when the lesion present reduces the peripheral blood flow without causing pulmonary congestion — for example, mitral incompetence and aortic valve disease (Gorlin et alii, 1952). However, there was little relation between tiredness and the nature or severity of cardiac lesions in the patients now being reviewed. A more important cause

of tiredness was emotional distress resulting from fear of heart disease, boredom, frustration and insecurity. These were often due to genuine physical incapacity but sometimes to unwarranted advice. Other factors causing tiredness were smouldering rheumatic activity, anæmia and chronic nutritional deficiency.

Dyspnœa.

Dyspnœa is the major symptom of patients with mitral stenosis and stems mainly from pulmonary congestion. The difficulties in gauging its severity may be extreme. Progressive limitation of activities is a satisfactory gauge of severity provided it is clear that the limitation is due to dyspnœa and not to tiredness. Sometimes patients will notice that they cannot walk and talk at the same time, and this should always be asked for if not volunteered spontaneously; it is a good indication of severe effort dyspnœa. Not infrequently, the patient has so regulated his life that he is never exposed to any but mild exertions. In these and in other cases a simple objective test can be valuable provided it is carried out by the physician himself. If a step is used, its height should be adjustable to suit the build of the patient, and there should be hand rails by which he can support himself and so gain in confidence. The patient is asked to step in time to a metronome or merely to the observer's counting until forced to desist by fatigue or dyspnœa. The rise in pulse and respiratory rate and the duration of the exercise are useful guides, but not so useful as the observation of the patient's general demeanour. The capacity for this simple type of exercise amongst patients with lesions of similar severity varies enormously, as it depends partly on many intangible factors which may be called collectively the "spirit". These factors vary not only from patient to patient but in the same patient from time to time, so that no table of standards could serve a very useful purpose. But when each patient's symptomatic and objective response to this simple form of effort is carefully gauged by the same observer, information of great value can be obtained to supplement the clinical history.

Orthopnœa.

Orthopnœa denotes advanced heart failure, but not necessarily severe mitral stenosis, as the heart failure may be due to other valvular lesions.

Acute Paroxysmal Dyspnœa.

Acute paroxysmal dyspnœa rarely occurs unless there is moderate to severe mitral stenosis. It results from severe pulmonary congestion and œdema, but is not very often caused by effort except in a group of patients with moderate to severe mitral stenosis who fail to develop much pulmonary hypertesion. In these, the right ventricle is still powerful and readily able to increase its output in the face of an increased inflow, so flooding the lungs. A prolonged emotional upset or any cause of prolonged tachycardia such as anæmia, thyrotoxicosis, infections or a paroxysmal arrhythmia are more frequent causes of pulmonary œdema. Pregnancy is another common cause.

Hæmoptysis.

The sputum may be streaked with blood in attacks of bronchitis, and small clots may be coughed up for days after pulmonary infarction. But not infrequently profuse hæmorrhages occur, and these may be recurrent over a number of years in patients with no other symptoms (Baker et alii, 1952). Massive hæmoptysis in patients with rheumatic heart disease almost always denotes moderate to severe mitral stenosis. The bleeding is thought to come from ruptured bronchial veins, which become engorged as the pressure in the latter rises. In this respect, hæmoptysis in mitral stenosis is analogous to hæmatemesis from œsophageal varices in portal hypertension (Ferguson et alii, 1944; Tobin, 1952).

Recurrent Bronchitis.

Patients with mitral stenosis are very liable to attacks of bronchitis, especially in the winter. This is usually an indication of moderate to severe mitral stenosis. When there have been many attacks over a number of years, emphysematous changes may occur which prevent any great clinical improvement after mitral valvotomy.

Pain in the Chest.

Constricting pain across the chest related to effort or recumbency usually denotes severe mitral stenosis unless there is an associated aortic valvular lesion. Stabbing or aching pain in the left breast region is commoner and has no more significance than in anxious patients without heart disease. An ill-defined deep-seated chest pain is sometimes found in patients with considerable cardiac enlargement and especially gross left auricular enlargement (Daley et alii, 1948).

Occasionally patients with severe mitral stenosis have few or no symptoms until some added factor occurs to tip the scale—for example, an infection (especially of the respiratory tract), pregnancy, anæmia, thyrotoxicosis, an arrhythmia, or systemic or pulmonary embolism. In these patients assessment of severity is difficult and depends largely on the physical signs.

The Assessment of Clinical Signs.

The second problem in selecting patients for mitral valvotomy is to determine the number of valve lesions present and the hæmodynamic significance of each. This requires evalution of all the physical signs, especially as murmurs alone do little more than indicate which valves are affected.

The Jugular Venous Pulse.

The central venous pressure is estimated from the filling of the right internal jugular vein with the patient propped up to 45°. The upper limit of normal is about three centimetres above the sternal angle—that is, about the clavicle level. The pressure in the left internal jugular vein is sometimes unduly raised even in health, owing perhaps to compression of the left innominate vein as it passes across the mediastinum. The external jugular vein may also give a false reading of the central venous pressure owing to damping or to constriction of the vein by fascia. Although an increase in central venous pressure denotes advanced heart failure, it need hardly be said that this may be due to other valvular lesions besides mitral stenosis.

If the amplitude of the internal jugular pulsation is wide, the upper and lower limits should be averaged to denote the central venous pressure. The main waves should then be timed against the carotid pulse. A big presystolic wave suggests tricuspid stenosis, or else gross right ventricular hypertrophy or merely prolongation of the P-R interval. If the main wave is systolic, of large amplitude and sustained, it denotes tricuspid incompetence. This may be due to organic disease of that valve, but more often it results from right ventricular dilatation secondary to pulmonary hypertension. Patients with gross tricuspid incompetence rarely do well after mitral valvotomy, even when satisfactory splitting of the mitral valve is achieved and no other valvular lesion is present.

The Arterial Pulse.

The characteristic effects of aortic stenosis and incompetence on the pulse need no further mention here. It must, however, be stressed that these must be looked for carefully, because if they are absent the mere presence of murmurs denoting aortic valve lesions need not contraindicate mitral valvotomy. The slow, rising, sustained pulse of aortic stenosis is frequently best appreciated from the carotid and not the brachial or radial pulse. Increased visible carotid pulsation (Corrigan's sign) will be found to be of great value in showing early aortic incompetence, for at rest there is very little or no visible carotid pulsation in patients with mitral stenosis or for that matter in normal people unless the stroke volume of the left ventricle is raised—for example, by excitement, anæmia, thyrotoxicosis or brachycardia. While the carotid pulsation is being estimated, the internal jugular vein on that side must be blocked by gentle pressure just above the clavicle.

Precordial Pulsations.

Fundamental to the problem of assessing the dynamic significance of the valve lesions which may be present is the determination of heart size and which of the ventricles is enlarged. That it is possible to do this usually more accurately by palpation than by any other method is due largely to the work of Paul Wood (1950) in England and of Dressler (1937) in America. One may also recall the words of Duroziez, who stated in his classical paper on mitral stenosis published in 1862: "One cannot accustom the hand too much to the diagnosis of heart disease for it may replace the ear."

The Apex Beat.—The size of the heart is traditionally determined by locating the apex beat. There is still, however, considerable disagreement as to how to define the apex beat, and what relationship the apex beat so defined bears to the underlying heart. The confusion is partly due to failure to recognize that there are at least two distinct vibratory sensations which may be perceived by the hand, and these may occur separately or together. The first is a true pulsation—that is, an outward movement of part of the chest wall due to the impact of some portion of the heart—and the second is a vibration in the chest wall synchronous with the first heart sound. This latter vibration, although sometimes quite localized and forceful—especially when the first heart sound is accentuated, as in mitral stenosis—does not cause outward movement of the chest wall. In normal persons it is not felt unless there is tachycardia or the first heart sound is accentuated for any other reason or unless the chest is thin. It is usually felt near the anatomical apex of the heart (as determined by fluoroscopy), but may be more diffuse and even widely palpable over the precordium. This physical sign cannot be used to indicate heart size. A real cardiac impulse is felt in only about 25% of normal adults when examined recumbent, even when those who are very obese or have emphysema are excluded. This observation made by Niehaus *et alii* (1945) I myself have confirmed in 300 consecutive adult hospital patients who had no cardiac disease or hypertension. The normal cardiac impulse is a gentle lifting movement, and the lowermost and outermost point where it can be definitely felt will be found to correspond fairly closely to the site of the anatomical cardiac apex determined by fluoroscopy. The main exception occurs when the heart is greatly enlarged or hyperdynamic, or if the area of pulsation of the chest wall is very diffuse for any other reason. When the left ventricle is enlarged or hyperdynamic the impulse becomes thrusting or heaving, forcefully lifting the examining finger from the chest wall. This pulsation rarely extends inwards more than a few inches towards the sternum (unless the right ventricle is also enlarged), because as the left ventricle contracts it tends to pull the right ventricle away from the chest and may produce retraction of the chest wall near the left border of the sternum just preceding the apex beat. The absence of a forceful lifting apical impulse does not, however, exclude the presence of left ventricular enlargement if there is associated enlargement of the right ventricle, because the clockwise rotation (looking from below) which may then occur displaces the left ventricle posteriorly away from the chest wall. This not infrequently occurs in mitral stenosis, when all that can be felt in the apical region is the tapping impact of the accentuated first heart sound (Wood, 1950). In pure mitral stenosis the left ventricle is normal or even small. If it is enlarged, it denotes an additional dynamically significant lesion, such as mitral incompetence, aortic valve disease or else hypertension. Therefore clinical evidence of left ventricular enlargement nearly always rules out mitral valvotomy.

Right Ventricular Pulsation.—Right ventricular enlargement usually causes pulsation to the left of the sternum in the fourth and fifth intercostal spaces. Occasionally in mitral stenosis, this pulsation may be due only to a greatly enlarged left auricle pushing the whole heart forward (Dressler, 1937). If there is no right ventricular pulsation present at rest, it should be sought for after the patient has been exercised. If it is still absent and the patient is not emphysematous, it is unlikely that he has severe mitral stenosis. Sometimes, however, right ventricular enlargement is shown only by undue substernal pulsation. This is felt by pressing the finger tips up under the xiphoid process of the sternum as the patient takes a deep breath. The degree of pulsation felt normally by this procedure varies according to the shape of the chest, the position of the heart and the laxity of the abdominal wall; but it is rarely forceful except in right ventricular enlargement. The pulsation of the abdominal aorta decreases as the diaphragm descends with inspiration, and so is easily differentiated.

Pulmonary Artery Pulsation.—If the pulmonary artery is considerably enlarged, denoting gross pulmonary hypertension, it may produce pulsation in the second left intercostal space. It should not be confused with the tapping impact of the accentuated second heart sound which can be felt in most patients with mitral stenosis.

Thrills.—No special diagnostic import can be given to cardiac thrills. They merely denote the presence of loud murmurs, the frequency components of which are such that they can be felt (Counihan *et alii*, 1951).

Percussion.

Percussion rarely adds to the information obtained by palpation. Normally cardiac dullness is confined to the left of the sternal border below the fourth intercostal space. Enlargement of the right ventricle and pulmonary artery may produce dullness behind the lower end of the sternum and in the third and even the second left intercostal spaces. Gross cardiac dilatation or enlargement of the left auricle may produce dullness to the right of the sternum.

Auscultation.

Since Duroziez (1862) described the loud sharp first heart sound, the widely duplicated second sound and rumbling diastolic murmur with presystolic accentuation characteristic of pure mitral stenosis with sinus rhythm, little has been added of help in our present problem. The cause of the loud first sound in mitral stenosis is not known; there are probably many factors. It may occur early in the disease, but not as a rule in childhood (Carey Coombs, 1924). It cannot be correlated with pressures in either the left auricle or pulmonary circuit, or with the area of the mitral valve found at operation. However, it tends to be muffled if there is mitral incompetence (Potain, 1894; Brigden *et alii*, 1953), a greatly reduced mitral blood flow or gross mitral valvular calcification (Wynn, 1953). Accentuation of the pulmonary second sound is a well-known sign of increased pressure in the pulmonary circulation and needs no further comment. In most patients with mitral stenosis the second sound is split. If the splitting is close and phasic with respiration (increasing with inspiration, decreasing or disappearing with expiration), it is usually to be ascribed to asynchronous closure of the pulmonary and aortic valves. This has no special clinical importance in rheumatic heart disease. More frequently the two sounds are widely separated (unless the heart rate is rapid), and the added sound is better heard in the apical region or in the third and fourth left intercostal spaces to the left of the sternum than at the base of the heart and has a superficial clicking quality. This sound was termed *"le claquement d'ouverture de la mitrale"* (opening snap of the mitral valve) by Rouchès (1888), and is probably produced in some way by the opening movement of the mitral valve (Wolferth and Margolies, 1932). It appears to have few clinical, hæmodynamic or pathological connotations, for it may be absent when the stenosis is extreme and present in the mildest cases. It tends to disappear if there is gross mitral valvular calcification (Wynn, 1953) or severe aortic or mitral incompetence (Brigden *et alii*, 1953). Its chief value as a physical sign is in sometimes indicating the correct diagnosis when the mitral diastolic murmur is absent or overlooked.

The confusion which previously existed in relation to mitral systolic murmurs has increased rather than the

reverse. Studies by direct palpation at operation and observations on left auricular pressures have shown that gross mitral incompetence may be found in patients who had no systolic murmurs, while there may be no evidence of mitral incompetence at operation in patients with very loud systolic murmurs (Wynn *et alii*, 1952). The louder the systolic murmur, however, the greater the likelihood of significant mitral incompetence. But this diagnosis should not be made without other evidence, especially clinical, radiological or electrocardiographic evidence of left ventricular enlargement.

Systolic murmurs at either the apical or parasternal areas are sometimes heard if there is considerable right ventricular enlargement or congestive cardiac failure, even in the absence of detectable tricuspid incompetence (Gorlin *et alii*, 1952).

The systolic murmur of aortic stenosis, although usually best heard at the base of the heart to the right of the sternum, is sometimes best heard in the mitral area. If there is congestive cardiac failure or a low aortic valve flow for any other reason, the systolic murmur may be faint and even absent, only to reappear as the cardiac function improves with treatment.

Detailed phonocardiographic and hæmodynamic studies have failed to add greatly to classical teachings concerning the mitral diastolic murmur. It is now widely known that the murmur is separated from the second sound by a short gap and may be confined to mid-diastole. The term presystolic murmur is largely discredited, for it encourages the student to listen to the wrong part of the cardiac cycle and has caused many normal persons with widely split or rough first heart sounds to be wrongly regarded as having mitral stenosis. In 100 patients with mitral stenosis studied by phonocardiography, I found only two who had short truly presystolic bruits with no evidence of a mid-diastolic component.

The factors upon which the loudness, quality and duration of the mitral diastolic murmur depend have been found so far to be too numerous to enable any useful correlation with the severity and type of underlying disease to be made. Occasionally (three out of 80 patients in this study) no mitral diastolic murmur can be heard. The reasons for this are not known; but all three of these patients had very severe stenosis and greatly reduced mitral blood flow. If mitral incompetence predominates and there is little stenosis, the diastolic murmur may be short and confined to mid-diastole—that is, the period when the rate of mitral blood flow is greatest.

In general, patients in whom all the elements of the auscultatory rhythm of Duroziez are present (a sharp first sound, no systolic murmur, an "opening snap" and a long rumbling mid-diastolic murmur), and who also have clinical evidence of right ventricular enlargement, are likely to prove suitable for operation. They are unlikely to have grossly calcified valve cusps, significant mitral incompetence or other serious valve lesions.

Assessment of the Electrocardiogram.

A detailed discussion of the electrocardiographic features to be found in patients with rheumatic heart disease is outside the scope of this paper. Patients with mild and moderate mitral stenosis have normal electrocardiograms or show evidence of widening and notching of the P waves, some right axis deviation in the standard leads and a "vertical" electrical position with clockwise rotation in the precordial leads. In advanced mitral stenosis with pulmonary hypertension, the P wave in leads II and III and aVF tends to become tall (greater than 2·5 millimetres) and the bifid contour replaced by a sharp peak (Sinclair Smith *et alii*, 1953). Definite evidence in the electrocardiogram of right ventricular enlargement or right bundle branch block nearly always denotes the presence of severe mitral stenosis and pulmonary hypertension. Thus an RS or R_S pattern in V_1 with inversion of T waves in V_1, V_2 and V_3 usually indicates moderate pulmonary hypertension, while an R or qR complex in V_1 indicates severe

pulmonary hypertension and right ventricular enlargement (Sinclair-Smith *et alii*, 1953).

Evidence of left ventricular enlargement in the electrocardiogram strongly indicates an associated valve lesion or hypertension, which would rule out mitral valvotomy. However, the right ventricular stress which is so often also present may obscure the electrocardiographic signs of left ventricular involvement. This is suggested, however, if there is left axis deviation in the standard leads and a "horizontal" position in the extremity leads, with little or no clockwise rotation and tall R waves in the precordial leads over the left ventricle.

Assessment by Fluoroscopy.

After clinical examination, fluoroscopic examination offers the most useful information; but there are limitations which deserve emphasis. Firstly, the size of cardiac chambers and great vessels subjected to mechanical stress is not clearly related to the degree of that stress. This is a familiar proposition in hypertensive heart disease, in which the size of the left ventricle may show no obvious relation to the elevation of systemic pressure. Clearly additional factors influence the response of the myocardium to strain, and only some of these are known—for example, nutritional deficiencies, coronary insufficiency and direct rheumatic damage.

In general, it is true that the larger the heart in rheumatic heart disease, the more severe the disease and the worse the prognosis (Baker *et alii*, 1952). However, there are many important exceptions to this statement, for the heart may be almost normal in size despite the presence of very severe mitral stenosis. When the cardiac enlargement is gross and generalized and not due to active rheumatic carditis or pericarditis, the outlook is bad even with operation. These patients are usually in chronic congestive cardiac failure. However, if a considerable decrease in heart size occurs with treatment of the cardiac failure, operation may prove to be of great benefit.

The size of the left auricle has been found not to correlate with either hæmodynamic (Bayliss *et alii*, 1950) or operative findings in mitral stenosis. Patients with aneurysmal dilatation of the auricle may have little or no cardiac disability until late in life (Daley *et alii*, 1948), while in patients with very severe symptoms left auricular enlargement may be slight (Baker *et alii*, 1952). Presumably dilatation of the auricle is determined more by the degree of rheumatic damage to its myocardium than by the increase in pressure resulting from mitral obstruction.

A forceful expansion of the left auricle during ventricular systole may be seen especially in the right anterior oblique view. This expansion has often been ascribed to mitral incompetence (Heim de Balsac *et alii*, 1949). However, it appears to be due usually to other factors, including retropulsion of the mitral valve cone into the auricle during ventricular systole (Wynn, 1952), and should not be taken as evidence of mitral reflux unless it is very gross and other features of mitral regurgitation are present.

Enlargement of the pulmonary artery and right ventricle correlate fairly closely with the severity of the mitral stenosis, and tend to be greater the higher the pulmonary artery pressure (Bayliss *et alii*, 1950). Assessment of the size of the left ventricle by fluoroscopy is readily made in those few cases of rheumatic heart disease in which there is little or no associated right ventricular enlargement—for example, pure mitral incompetence or lone aortic valvular lesions. When the right ventricle is also enlarged, it is virtually impossible to determine the size of the former chamber radiologically, because the left ventricle is rotated posteriorly by the enlarged right ventricle, which causes it to appear more prominent in the left anterior oblique view.

The detection of pulmonary congestion or œdema by fluoroscopy usually denotes severe mitral stenosis, but its absence does not exclude this diagnosis. Thus the peripheral lung fields may appear fairly clear if there is associated pulmonary hypertension due either to organic

obstruction or to vasospasm of the pulmonary arterioles. However, in these instances the main pulmonary arteries appear enlarged as a rule (Sinclair-Smith et alii, 1952).

The presence of hæmosiderosis has not been found to correlate with any clinical or hæmodynamic features of mitral stenosis (Baker et alii, 1952); nor has the presence of gross calcification of the mitral valve, although significant mitral incompetence is more common in these patients. However, the mitral valves may be quite competent despite the presence of very extensive valvular calcification (Wynn, 1952).

Discussion and Conclusion.

The time which has elapsed since mitral valvotomy has been undertaken on a large scale is too short to permit its scope to be properly assessed. In skilful hands the risks of operation are not high (7%—Logan and Turner, 1953) and are indeed negligible in "good risk" subjects. These are patients with mitral stenosis as the only lesion, with relatively small hearts, who are not in congestive cardiac failure. Patients with mitral stenosis should be offered the help of surgery when from a consideration of the symptoms or signs it is clear that they have moderate to severe mitral obstruction, but before they have progressed to chronic congestive cardiac failure. The selection of patients is made more difficult by the frequent presence of other valvular lesions which are not amenable to surgical treatment at the present time. Of these, mitral insufficiency is the most difficult to diagnose. It occurs in two main forms, rarely as an isolated lesion, but more commonly in combination with severe mitral stenosis. Isolated mitral insufficiency may be readily diagnosed by clinical, radiological and sometimes electrocardiographic evidence of left ventricular enlargement associated with a mitral systolic murmur, which is usually loud. In addition the first sound may be muffled, the opening snap absent and the diastolic murmur short, absent or replaced by a third heart sound. The left auricle is usually large and may be aneurysmal. Evidence of pulmonary hypertension and right ventricular enlargement is uncommon, but may be present.

If mitral stenosis is present it may be impossible to assess the presence or degree of mitral incompetence. The best sign is a forceful left ventricular apex beat in the absence of aortic valve disease or hypertension. But this may be absent if the left ventricle is rotated posteriorly by an enlarged right ventricle. Resort can then be had to fluoroscopy and electrocardiography, the limitations of these procedures being borne in mind. Until better methods of diagnosis are evolved, it would seem justifiable to advise operation in doubtful cases if there is evidence of severe mitral stenosis. If at operation mitral incompetence is encountered in addition to stenosis, mobilization of the valve leaflets may decrease the severity of the former lesion.

The presence of aortic systolic or diastolic murmurs without enlargement of the left ventricle or peripheral signs of a significant aortic lesion should not contraindicate operation.

Tricuspid stenosis occurs rarely, and the diagnosis should rest upon the demonstration by cardiac catheterization of an increased pressure gradient across the tricuspid valve in diastole. Prominent presystolic pulsation in the jugular veins is insufficient evidence alone, for it may occur with pulmonary hypertension and failure of the right side of the heart if sinus rhythm persists, or with prolongation of the P-R interval.

Tricuspid incompetence is rarely due to organic disease of that valve, but results from gross dilatation of the right ventricle secondary to pulmonary hypertension. In such cases it is not an absolute contraindication to mitral valvotomy, although such patients rarely do very well after operation. Evidence of severe pulmonary hypertension is an unfavourable feature, because it may persist despite successful relief of the mitral stenosis if it is due to organic changes in the pulmonary arterioles. There is, however, no ready means of telling this, while postoperative catheter studies have shown that a significant

fall in pulmonary artery pressure occurs in many patients if the mitral obstruction is relieved (Baker et alii, 1952).

Continuing rheumatic activity and bacterial endocarditis are absolute contraindications to operation. Patients who are bed-ridden or severely incapacitated with long-standing congestive cardiac failure, multiple valve lesions and gross cardiac enlargement are unsuitable for operation. The operative mortality and morbidity in this group are high and the chances of a good result small. Unfortunately, many of these patients demand operation as their one hope of salvation. The task of the physician is to seek surgical aid while this may still be a help and not a gamble with the odds heavily against success.

Summary.

1. The selection of patients for mitral valvotomy can usually be made by careful consideration of symptoms and signs, together with electrocardiography and fluoroscopy. Rarely will additional investigations be required.

2. Effort dyspnœa and hæmoptysis are the two most important symptoms. When the effort tolerance is assessed, allowance must be made for a decrease in physical capacities due to psychological factors. Shortness of breath and not weakness should be the factor which limits effort.

3. By careful evaluation of physical signs the number of valve lesions may be determined and usually the hæmodynamic significance of each.

4. If the left ventricle is enlarged, there is an additional lesion present which virtually rules out mitral valvotomy. The best evidence of left ventricular enlargement is obtained from the character of the apex impulse. Electrocardiography and fluoroscopy are less helpful unless there is no associated right ventricular enlargement.

5. The absence of clinical evidence of right ventricular enlargement, including an examination after effort, virtually excludes the possibility of significant mitral stenosis.

6. Although it is difficult to assess the presence and degree of mitral incompetence if there is also mitral stenosis, the following points are helpful: muffled first sound, loud mitral systolic murmur, no "opening snap", short or absent mid-diastolic murmur, a loud third heart sound, clinical, electrocardiographic or fluoroscopic evidence of an enlarged or hyperdynamic left ventricle, a large left auricle, gross systolic expansion of the left auricle.

7. Gross mitral incompetence may occur in the absence of a systolic murmur and a loud mitral systolic murmur in the absence of mitral incompetence.

8. Patients with very large hearts, long-standing congestive cardiac failure, gross tricuspid incompetence, significant aortic lesions or mitral incompetence rarely benefit much from mitral valvotomy.

9. The ideal subject for mitral valvotomy is the young patient with moderate limitation of effort, a small heart and mitral stenosis as the sole valve lesion. The operation mortality and morbidity in these patients are low, and the clinical improvement is often remarkable.

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THYROID SYMPOSIUM III: THE USE OF RADIO-ACTIVE IODINE I^{131} IN THE DIAGNOSIS OF HYPERTHYROIDISM: PHYSICAL ASPECTS.[1]

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As far as it is known, radioactive iodine (I^{131}) is biologically indistinguishable from stable iodine (I^{127}). It has a half-life of 8·0 days and in its decay it emits β and γ radiations which can be detected by means of sensitive Geiger counters. If, therefore, I^{131} is introduced into the human body, either orally or intravenously, its passage through the body can be followed. It is thus possible to determine, at any particular time, the proportions of the administered dose present in the thyroid and excreted in

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the urine, as well as the concentration of I^{131} in various fractions of the blood. Such determinations are generally carried out with the use of so-called tracer quantities of I^{131}—quantities which are so small that they cannot be detected by ordinary chemical methods, and which do not affect the physiological processes, at least to any measurable degree.

Many workers over the last twelve years have carried out studies of the thyroid gland, using tracer doses of I^{131}, in the hope that a practical method could be developed which would be of assistance in determining the hyperactive, hypoactive or normally functioning state of the thyroid.

Generally, provided the thyroid has not been influenced by medication, the toxic gland displays a rapid initial accumulation of I^{131} rising to a high maximum. The subsequent fall may be slow in some cases and rapid in others, as depicted by the two "toxic" curves in Figure I. The normal gland, on the other hand, displays a slower initial rise and a lower maximum followed by a steady fall, while in the hypothyroid state there is a generally low uptake. Thus, broadly speaking, the characteristics of the thyroid uptake curves are related to the functioning state of the gland.

Since the thyroid and kidneys are the main competitors for the inorganic iodine present in the blood, the majority of the iodine not taken up by the thyroid is excreted by the kidneys. The urinary excretion of I^{131} can therefore be expected to reflect approximately the functional state of the thyroid, except in cases of renal disorder. Typical excretion curves are shown in Figure II.

In practice, however, it is found that there is an appreciable spread in both the uptake and excretion curves for individuals within the respective groups, and this overlap often leads to difficulty in the interpretation of the curves in borderline cases.

Most workers have selected a particular index of thyroid function (for example, the rate of accumulation of I^{131} by the thyroid, the proportion of the dose retained by the gland after twenty-four hours, or the proportion excreted during the first twenty-four hours), and have obtained numerical values of the index for a series of cases assessed on clinical and other grounds as "normal" or "thyrotoxic". Practically every index chosen has been found to distinguish between the frankly thyrotoxic patient and the normal subject, but there has generally been an appreciable overlap of the values for normal patients and borderline cases of hyperthyroidism.

Astwood and Stanley (1947), using an end-window *counter at a fixed distance from the thyroid, reported that* the early part of the thyroid uptake curve could be treated as a parabola, so that if the uptake of I^{131} was *plotted against the square root of the time after administration, a straight line graph could be drawn, the slope of which they termed the "accumulation gradient". They found that thyrotoxic patients showed a greater accumulation gradient than patients in a non-toxic state, and have used this factor as an indication of thyroid function.*

Keating, Power, Berkson and Haines (1947) reported that the urinary excretion curve for I^{131} could be well represented by the following formula:

$$Q = Q_f(1 - e^{-rt})$$

where Q = the amount of I^{131}, expressed as a fraction of dose, excreted in time t, Q_f = the asymptote of the curve, r = the proportional rate of disappearance of iodine from the blood, and t = the time after administration of the I^{131}.

If the rate of removal of iodine from the blood by all tissues is proportional to the concentration in the blood, then rQ_f is the rate of excretion of iodine by the kidneys and $r(1 - Q_f)$ is the rate of removal of iodine from the blood by all tissues other than the kidneys.

These workers termed $r(1 - Q_f)$ the "extrarenal collection rate" and stated that it was a good index of the thyroid collection rate, since this gland is the principal extrarenal collector of iodine. The rate r can be evaluated from the slope of a semi-logarithmic plot of $(Q_f - Q)$ against t, but this necessitates a prior knowledge of the

value of Q_f. Q_f, therefore, has to be estimated by inspection of the excretion curve and adjusted to give a linear relation between log $(Q_f - Q)$ and t.

Werner, Quimby and Schmidt (1948, 1949) and later Jaffe and Ottoman (1950), using shielded end-window counters at 15 centimetres and 10 centimetres respectively from the anterior skin surface over the thyroid, stated that the retention of I^{131} in the thyroid twenty-four hours after administration was a good index of the functioning state of the gland.

Skanse (1948) found good separation of the toxic and non-toxic groups using the I^{131} content of the urine collected in the first twenty-four hours, and good separation between the hypothyroid and non-hypothyroid groups using the I^{131} content of the urine collected between twenty-four and forty-eight hours after administration.

Myant, Pochin and Goldie (1949) reported that if the rate of uptake of I^{131} in the thyroid was plotted against the concentration of I^{131} in the plasma, a linear relation-

the bulk collections over specified time intervals. In order to reduce to a minimum the risk of losses in the collection of urine, the patients were kept in hospital for this period.

From the analysis of the shape of the curves in their group of 24 cases, Oddie and Scott (1950) tentatively concluded that the initial uptake rate k_1 varied widely and did not promise to be of immediate diagnostic use, but that k_4, which measured the fraction of organic iodine leaving the thyroid as hormone in unit time, might be used to diagnose toxic conditions. They mentioned that k_4 had to be found from the uptake curve; k_4 could not be measured directly, but was derived from other factors by the use of the following formula:

$$k_4 = -m_2\left(\frac{k_1 a}{k_3 \beta} + 1\right)$$

where the symbols had the following meanings: m_2 was the slope of the latter portion of the uptake curve, and, according to their theory, should be equal in magnitude to
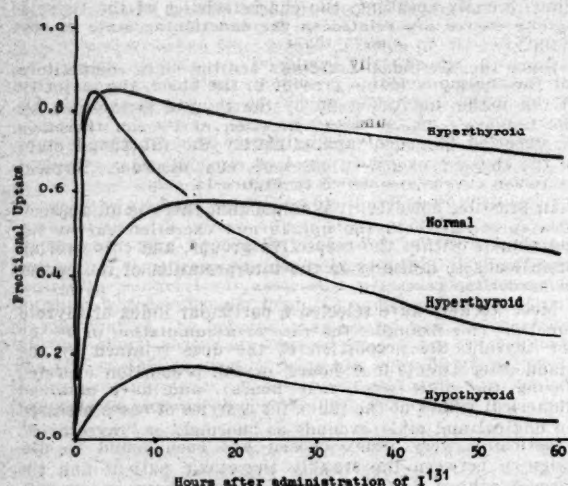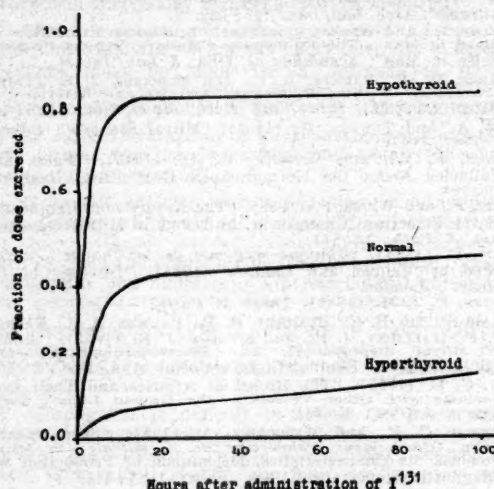
FIGURE I.
Typical thyroid uptake curves.

FIGURE II.
Typical I^{131} excretion curves.

ship held for the early hours after administration of the radio-isotope. Later, the liberation of I^{131} from the gland and the accumulation of protein-bound I^{131} in the plasma disturbed this proportionality. From this observation they concluded that the thyroid cleared a constant volume of plasma of its I^{131} per unit time, and in a series of tracer investigations carried out on hyperthyroid, hypothyroid and euthyroid subjects they found this "effective thyroid clearance rate" a good index of the activity of the gland.

Mason and Oliver (1949a, 1949b) reported that the I^{131} content of the urine excreted in the period six to twenty-four hours after administration was a reliable index of thyroid function, while Arnott, Emery, Fraser and Hobson (1949) found that the excretion in the eight to twelve hour period showed good differentiation between the toxic and non-toxic groups.

About the same time Oddie and Scott (1949a, 1949b, 1950) carried out a mathematical analysis of the full uptake and excretion curves taken over several days, and obtained numerical values for a series of indices in a small group of patients. The mathematical analysis was based on their proposed theoretical metabolic scheme for iodine, and the explanation of the various indices can be made by reference to Figure III.

The uptake curve was obtained by determining the proportion of the administered dose present in the thyroid at particular times over at least four days. The excretion curve was determined by collecting all the urine excreted during the four days after administration and assaying

the corresponding slope of the excretion curve; k_1, the thyroid uptake rate factor, was the slope of the tangent to the uptake curve at the time of injection $t = o$; k_3 was similarly the initial slope of the excretion curve; α was found by extrapolating the long-term portion of the excretion curve to cut the ordinate at $t = o$; and β was found similarly by extrapolating the long-term portion of the uptake curve.

The evaluation of k_4 was therefore dependent on the long-term measurements of uptake and excretion when the amounts of I^{131} remaining in the thyroid and being excreted were diminishing. In order that reasonable accuracy could be obtained in the latter portions of the curves, tracer doses of 100 microcuries were found to be necessary. The physical measurements and calculations involved in the determination of k_4 were rather lengthy and, furthermore, the value of k_4 could not be obtained in much less than a week.

In September, 1950, it was decided to examine the usefulness of all the above-mentioned physical indices in a planned investigation on a common series of patients, and to compare the indications of thyroid function given by these indices with the basal metabolic rate, the biochemical determination of plasma protein-bound I^{127} (Winikoff, 1954), and the clinical assessment (Madigan and King, 1954). In this way it was hoped that the most satisfactory physical index could be selected from the viewpoints of accuracy of assessment, rapidity and ease of test, and minimal tracer dose required.

EXPERIMENTAL PROCEDURE.

First Series of Tests.

Tracer doses of 100 microcuries of I^{131} in 2·5 millilitres of solution with 100 microgrammes of sodium iodide as carrier were administered intravenously. In each case the residue in the bottle containing the dose, together with the rinsings of the syringe system, was assayed by means of a Twentieth Century Electronics M.6 or M.12 liquid counter, so that the net dose which had been administered could be determined.

Measurements of the I^{131} taken up by the thyroid at various times after administration were made with the procedure described by Oddie and Scott (1949b), using a shielded end-window General Electric Company G.M.4 counter. This necessitated measurements with the counter centred in turn over each lobe of the gland at distances of 1·5, 4·0 and 8·0 centimetres, the content of the gland being then determined by calculation. The necessary readings to determine each point of the uptake curve required approximately twenty minutes.
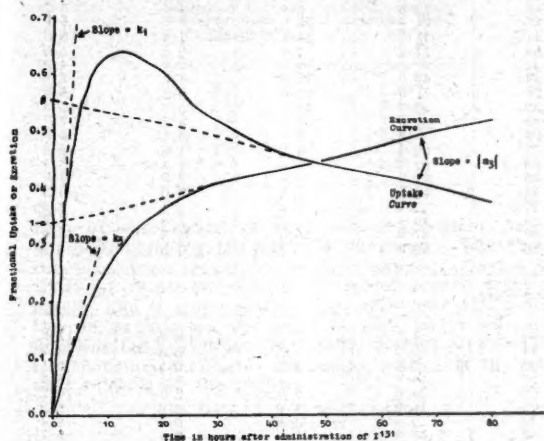

FIGURE III.

Uptake and excretion curves denoting the variables used by Oddie and Scott.

A blood sample was taken at a convenient time t, between one and two hours after administration, the plasma was separated by centrifuging and the I^{131} concentration was estimated with a liquid counter. The tangent to the uptake curve at time t gave the corresponding rate of uptake of I^{131} by the thyroid in percentage of the dose per minute, and the effective thyroid clearance rate in millilitres per minute was then given by the following calculation.

Uptake rate in percentage of the dose per minute

Plasma concentration in percentage of the dose per ml.

Bulk urine collections were made for the approximate periods one, three, six, twenty-four, forty-eight and seventy-two hours after administration, assayed by the use of a liquid counter, and the results plotted as total I^{131} excreted (expressed as a fraction of the net dose) against time.

From the foregoing data the indices suggested by the various workers mentioned earlier were evaluated. It was found, however, that the uptake curves obtained did not approximate to a parabola for a sufficiently long period to enable an accurate determination to be made of the "accumulation gradient" of Astwood and Stanley. It was also found (as has been reported by Mason and Oliver, 1949b) that the excretion curves did not follow an exponential relationship for a long enough period to enable the extrarenal collection rate of Keating and his co-workers to be determined accurately.

It was further observed that for patients in a toxic state the net loss of I^{131} from the gland subsequent to the peak value of uptake varied considerably with individuals (see Figure I). In consequence, the values of the uptake at twenty-four hours for patients in a toxic condition varied widely, so that the numerical value was not a good index of toxicity. This observation has also been made by Myant, Pochin and Goldie (1949).

The determination of k_1 was subject to some degree of error because, with the counting method used by Oddie and Scott, it was not possible to determine many points for the early part of the uptake curve. In accordance with their method, two points were determined at approximately 60 and 120 minutes respectively after injection, and the best curve was drawn through these points and the origin. This made the accurate drawing of the uptake curve, and thus the tangent to it, somewhat difficult.

The accuracy with which k_4 could be determined was affected very seriously by the cumulative errors in the five measured factors from which it was calculated (see Figure III). For instance, the accuracy of k_5, dependent upon frequent collections of urine, could be influenced by kidney and bladder dysfunction as well as by losses of urine which occasionally occurred. It was also found that m_3 (which theoretically could be determined from the latter portion of either the uptake or the excretion curve) was in some doubt. Values of m_3 derived from the two curves were often found to vary very widely (in ratio by as much as from 50% to 200%, even with curves for which the experimental data appeared to be satisfactory); accordingly the value of m_3 used in the determination of k_4 was taken from the uptake curve only.

Results of the First Series of Tests.

During the period from October, 1950, to June, 1952, 90 complete tracer studies were carried out on 67 patients. In some cases all the indices could not be determined because of incomplete uptake or excretion data; in others, the patients had received, within three weeks prior to investigation, certain drugs which are known to have influenced the uptake of iodine by the gland; whilst in a third group of patients the clinical assessment was so much in doubt that no definite opinion was expressed. As a result, only the observations of 52 tracer studies (32 on patients in a non-toxic state and 20 on patients in a toxic state) were available for a complete comparison between all indices. A large proportion of these patients were in a clinical condition regarded as only "mildly toxic".

The results of these 52 tracer studies are given in Table I.

Because of the small number of cases and the large number of indices being compared, the collected results were referred for statistical analysis to Dr. F. E. Binet, of the Department of Statistics, University of Melbourne. This analysis showed that the best correlation of the physical indices with the clinical assessment was given by the uptake rate factor k_1, and if 0·93hr^{-1} was considered to be the demarcation between the toxic and non-toxic groups, this would give the minimum misclassification of patients—namely, about 11%. This accuracy of classification could not be improved by the combination of k_1 with any of the other physical indices; but if the classification was taken in combination with the PBI[47] in the following criterion, then the misclassification was significantly reduced to about 6%. The criterion is as follows: $1·909\sqrt{PBI}$ in γ% + 2·297 log ($k_1 hr^{-1}$) − 4·838, and if all positive results were classified as "toxic" and all negative results as "non-toxic", then the misclassification would be about 6%.

This analysis indicated that, of the physical indices studied, the initial rate of uptake of I^{131} by the thyroid was the most satisfactory for distinguishing between hyperthyroid and euthyroid patients. However, the experimental technique did not lend itself to accurate measurements during the period immediately after injection when the I^{131} content of the gland changes rapidly; furthermore, the patient was required to lie still in one position for extended periods, and this was found to be very trying, particularly for the patients in a toxic state.

TABLE I.

Results of the First Series of Tests, Subjected to Statistical Analysis.

Case Number.	k_1 hr⁻¹.	k_2 hr⁻¹.	α	Thyroid Clearance Rate. (Millilitres per Minute.)	24 Hours Uptake. (Per Centum.)	0 to 24 Hours Excretion. (Per Centum.)	6 to 24 Hours Excretion. (Per Centum.)	8 to 12 Hours Excretion. (Per Centum.)	PBI¹³¹ γ% (Microgrammes per 100 Mils— Winikoff, 1954.)
Patients in a Non-Toxic State.									

Case Number.	k_1 hr⁻¹.	k_2 hr⁻¹.	α	Thyroid Clearance Rate.	24 Hours Uptake.	0 to 24 Hours Excretion.	6 to 24 Hours Excretion.	8 to 12 Hours Excretion.	PBI¹³¹ γ%
1	0.26	0.0008	0.70	45	63	29.8	4.8	1.6	5.3
2	0.49	0.0011	0.60	53	53	40.1	10.1	3.4	5.4
3	0.15	0.0008	0.56	31	29	43.5	10.5	3.6	5.6
4	0.28	0.0082	0.31	3	17	62.7	33.0	8.9	6.1
5	0.43	0.011	0.73	59	66	27.5	7.1	2.6	7.7¹
6	0.27	0.0045	0.65	33	43	35.7	13.5	5.5	5.6¹
7	0.23	0.0067	0.39	97	21	59.6	17.2	5.6	4.5
8	0.19	0.0068	0.23	16	22	71.0	34.8	13.2	5.7
9	0.50	0.0020	0.70	59	60	30.6	3.6	1.3	6.0
10	0.40	0.0084	0.64	68	46	37.1	6.6	2.8	6.5
11	0.20	0.0031	0.46	35	48	53.2	14.3	5.0	6.1
12	2.2	0.77	0.95	210	43	7.6	1.8	0.6	7.4
13	0.79	0.0013	0.74	88	81	26.1	3.9	1.4	5.0
14	0.69	0.0028	0.76	62	73	25.0	3.7	1.3	4.1
15	0.80	0.07	0.85	156	46	15.6	5.2	1.5	5.7
16	0.21	0.002	0.28	14	26	71.2	22.9	9.2	3.5
17	0.20	0.0020	0.43	19	47	53.7	24.7	7.6	6.0
18	0.40	0.0017	0.63	38	58	37.2	7.4	2.3	5.8
19	0.31	0.0074	0.54	22	47	47.0	7.2	2.2	4.9
20	0.82	0.0023	0.57	20	43	43.6	12.6	4.3	2.9
21	0.26	0.0005	0.29	5	26	71.0	21.0	8.2	6.5
22	0.25	0.0009	0.56	18	49	43.7	14.1	5.5	5.3
23	0.65	0.0067	0.68	18	61	32.0	11.5	3.7	7.7
24	3.4	0.012	0.94	244	94	5.9	0.4	0.1	4.9
25	0.56	0.0058	0.70	100	72	30.4	4.6	1.8	5.8
26	0.49	0.0045	0.79	60	63	21.4	3.6	1.4	5.1
27	0.30	0.036	0.76	74	36	24.9	6.7	2.0	4.0
28	0.32	0.013	0.60	54	44	40.7	8.8	3.0	6.2
29	0.53	0.010	0.83	66	77	17.0	2.4	1.1	7.5
30	0.32	0.0015	0.45	25	53	54.4	11.4	4.3	5.3
31	0.45	0.0025	0.63	48	66	37.0	26.5	3.6	5.8
32	0.23	0.0029	0.39	18	32	59.0	25.2	7.8	7.9¹
Patients in a Toxic State.									
33	3.6	0.23	0.96	277	68	7.1	2.1	0.4	11.2
34	1.1	0.035	0.92	404	84	9.4	1.3	0.3	8.7
35	1.2	0.41	0.96	191	42	7.2	2.4	0.5	7.5¹
36	1.1	0.009	0.82	135	51	16.8	5.4	1.5	11.8
37	0.52	0.0097	0.65	29	68	35.2	9.6	2.5	10.2
38	0.67	0.003	0.82	113	76	18.2	1.0	0.6	5.8¹
39	4.5	0.12	0.96	381	78	4.8	1.0	0.2	8.4
40	0.40	0.0024	0.63	34	53	35.0	10.5	3.4	9.7¹
41	0.72	0.030	0.90	205	80	11.5	1.2	0.3	9.4
42	1.1	0.022	0.79	90	70	22.1	4.1	1.0	10.6
43	0.67	0.027	0.89	148	79	11.4	2.2	0.7	16.1
44	3.0	0.86	0.98	48	80	3.8	1.2	0.3	9.6
45	1.5	0.11	0.77	45	56	24.6	6.1	1.8	8.2
46	1.4	0.077	0.93	191	74	8.4	1.5	0.4	7.9
47	1.5	0.0024	0.88	224	78	12.2	0.7	0.2	2.5¹
48	0.44	0.030	0.65	41	50	36.9	9.0	3.4	8.5
49	1.1	0.018	0.93	214	85	7.5	0.7	0.2	12.4
50	2.4	0.062	0.92	218	74	10.1	2.5	0.6	13.0
51	1.3	0.037	0.82	168	69	21.2	2.6	0.6	12.8
52	1.6	0.056	0.91	222	63	11.0	1.8	0.4	10.0

¹ These patients showed excessive day-to-day variation.

It was therefore decided to develop new measuring equipment to try to overcome these difficulties.

Two groups of workers had reported the use of multiple counter systems which tend to reduce the effect of errors in the localization of the thyroid, in the positioning of the counters with respect to the patient, and in slight movements of the patient during the period of measurement.

Tait, Cook and Worsnop (1951) use two shielded γ counters placed anteriorly and posteriorly to the patient's neck at the level of the thyroid, the separation of the counters being 30 centimetres, whilst Freidberg and his co-workers (1950) use four shielded γ counters on a 90-centimetre diameter circle about the patient's neck. The counters in both methods are connected in electrical parallel so that the scalar unit records the total counts from all tubes. A standard correction for absorption and scattering of the γ rays in the neck is applied to the neck counting rate, and the I¹³¹ content of the neck is then determined by comparison with the counting rate from a standardized reference source of I¹³¹. In both these methods the patient is reqired to be seated with the counters mounted in a horizontal plane about his neck. No correc-

tion appears to have been made for the I¹³¹ contained in the non-thyroid neck tissue, or for the variation in the absorption and scattering of γ rays in necks of different sizes.

Second Series of Tests.

As has been observed by others (Soley and Miller, 1948), the thigh, just above the knee, is about the same size and shape as the neck, and since the collection of iodine by body tissues other than the thyroid and kidney is relatively small, it can be assumed that the I¹³¹ content of the non-thyroid neck tissues is approximately equal to the I¹³¹ content of a similar volume of thigh tissue. This assumption is made in the following procedure.

The new measuring apparatus is shown in Figure IV. A supine position has been adopted for the patient to provide for those who cannot readily remain seated, and to reduce the likelihood of bodily movement. The neck and thigh counting rates are determined by means of separate counter units.

Each unit consists of two shielded Twentieth Century Electronics G10Pb counter tubes at a fixed distance apart and connected in electrical parallel. The pulses from the

paired tubes are fed into separate preamplifiers whose outputs are conveyed to a change-over box, where they are switched in turn into the scalar unit and counted.

Each G10Pb counter is mounted in a rectangular lead housing to reduce the effect of radiation from outside the field of observation, the unshielded face being covered with a black ebonite sheet to exclude light.

The shielded counters of the neck unit are fixed in a vertical position to an inverted U-shaped tubular steel frame, which is attached to the horizontal arm of an X-ray tube stand so that the frame can be moved freely in any direction. The counters are parallel and 42 centimetres apart between centres, and the lead housings are angled 15° inferiorly to the transverse plane of the neck so that, for any patient, the gland is contained within the

TABLE II.
Correction Factors for the Lateral Displacement of the Centres of the Thyroid Lobes from the Antero-Posterior Mid-line.

Estimated Lateral Displacement. (Centimetres.)	Divide Thyroid Counting Rate by
0·0	1·00
1·0	1·01
2·0	1·04
3·0	1·09
4·0	1·15
5·0	1·23

field of observation of both counters without the lead housings touching the patient's shoulders. The choice of this separation was a compromise between a higher sensitivity in counts per minute per microcurie at shorter distances, and a more uniform response over the centre of the region between the counters with larger separations. A calibrated adjustable positioning marker attached to the lead housings facilitates the correct setting of the counter unit relative to the patient.

TABLE III.
Correction Factors for the Difference Between the Absorption and Scattering of γ Rays in the Neck and in the Standard Neck Phantom.

Lateral Diameter of Neck at Level of Thyroid. (Centimetres.)	Multiply Thyroid Counting Rate by
6·0	0·98
8·0	0·99
10·0	1·00
12·0	1·01
14·0	1·03
16·0	1·05
18·0	1·07

The lead housings of the thigh counter unit are fixed rigidly to a base-board so that the counters are parallel and 23·5 centimetres apart between centres. The unit is laid flat on the couch so that the patient's thigh can be positioned centrally between the counters. With this separation the counting rate obtained with the thigh unit from I^{131} in a distributed source (for example, a thigh) is three times the counting rate obtained with the neck unit from a similar source. The approximate correction for the I^{131} contained in the non-thyroid neck tissue, therefore, is simply one-third of the thigh counting rate.

Further corrections to the thyroid counting rate are made to allow for the absorption of γ rays in the neck tissue, and for the estimated lateral displacement of the effective radioactive centres of the thyroid lobes from the antero-posterior mid-line. The I^{131} content of the gland is then determined by comparison of this corrected counting rate from a known source of I^{131} in a standard wooden neck phantom placed between the counters.

The approximate corrections for the absorption of γ rays in necks of different sizes and for the lateral displacement from the mid-line of the I^{131} contained in the thyroid lobes have been determined from extensive work on phantoms of different sizes and are given in Tables II and III.

The largest source of error in this method, as in others, arises from the difficulty of locating the thyroid gland accurately. The effect of various errors in the location of the gland on the final determination of uptake has been estimated from work on phantoms, and even if all these
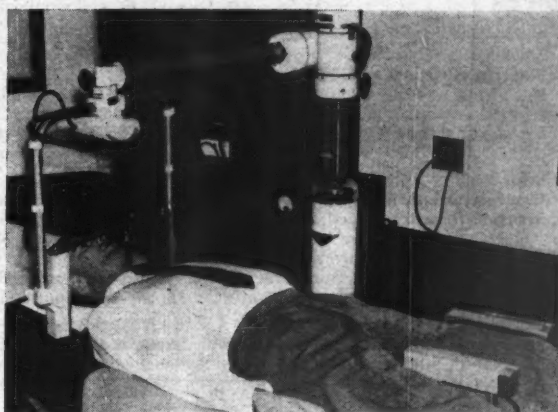
FIGURE IV.
Uptake measuring apparatus using laterally displaced G10Pb counters.

errors were additive it is believed that the maximum error in the evaluation would not exceed 8%.

This method of measurement has permitted the reduction of the size of tracer dose used to 20 microcuries of I^{131}. It is administered intravenously as before, but now no carrier iodide is added. As the normal daily dietary intake of iodine is of the order of 50 to 200 microgrammes, the
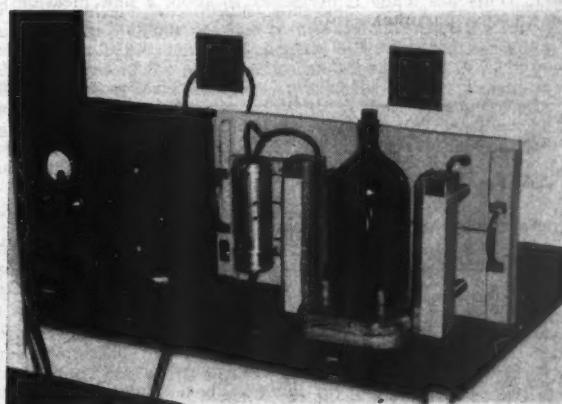
FIGURE V.
Set-up for measuring the radioactivity in urine.

addition of carrier iodide to the tracer doses is considered undesirable even though the work of Skanse (1948) indicates that quantities up to 100 microgrammes will not appreciably affect the iodine metabolism.

In cases in which it is considered that a knowledge of the excretion of I^{131} will provide additional useful information, the patient's urine excreted during specified periods is collected in standard 70-ounce bottles, and water is added

to bring each volume up to two litres. Each bottle is then positioned centrally on a stand between the G10Pb counters of the thigh unit (see Figure V) and the counting rate compared with that obtained from a standard I[131] reference source. This method is simpler and more sensitive than taking aliquots and assaying the solutions using the M.6 or M.12 type Geiger counters mentioned previously.

It is interesting to note that Reiss and his co-workers (1952) have also obtained similar thyroid uptake curves, but in their observations the initial rise extended over the first ten to fifteen minutes after injection.

As a routine procedure it is possible to carry out the injection, make the patient settled and comfortable and have the counters correctly positioned easily within ten

FIGURE VI.

Typical thyroid uptake curve, showing the rapid accumulation of I[131] within the first half-minute after injection.
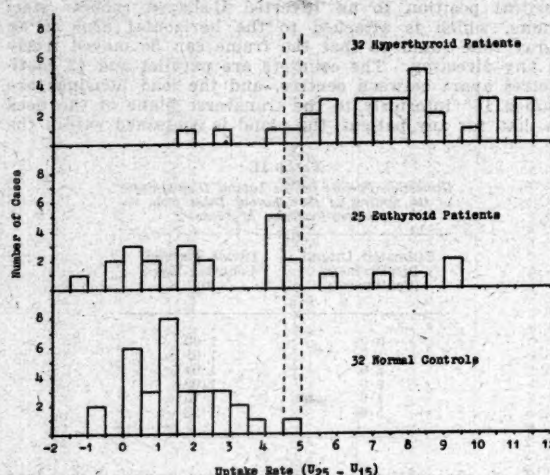
FIGURE VII.

Distribution of the $(U_{25}-U_{15})$ determinations in percentage of the dose.

With this technique the I[131] content of the thyroid has been measured very soon after the injection, and the results show that the early part of the uptake curve is not an exponential rise over the first hour or two, as had been assumed by Oddie and Scott (1949a), but is made up of a very rapid uptake within approximately the first half-minute, followed by a much more gradual rise (Figure VI). This has made it necessary to adopt a new measure of the thyroid uptake rate.
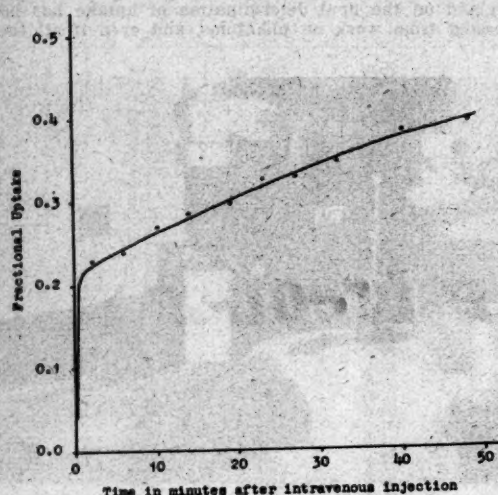
minutes. Accordingly the portion of the uptake curve most conveniently obtained is that from ten to thirty minutes after injection.

After study of this portion of the uptake curves of a group of normal subjects and subjects in non-toxic and thyrotoxic states, it has been found that the best measure of the thyroid uptake rate is the increase in the accumulation of I[131] by the gland in from fifteen to twenty-five minutes, expressed as a percentage of the administered

TABLE IV.
Summarized Results of Tracer Studies.

Clinical Assessment.	Subjects Studied between October, 1950, and June, 1952. I_1.				Subjects Studied between July, 1952, and May, 1953.									
					$U_{25}-U_{15}$.					Forty-eight Hour PBI[131].				
	Number of Subjects.	Number of Tests.	Correct.	In-correct.	Number of Subjects.	Number of Tests.	Correct.	Un-certain.	In-correct.	Number of Subjects.	Number of Tests.	Correct.	Un-certain.	In-correct.
Normal control group: no obvious or suspected thyroid dysfunction	—	—	—	—	32	32	31	1	0	22	22	21	1	0
Classified euthyroid: no known influencing medication ..	40	44	40	4	22	22	15	2	5	17	17	13	1	3
Classified hyperthyroid: no known influencing medication	21	28	22	6	23	28	24	1	3	22	26	25	1	0
Total	61	72	62	10	77	82	70	4	8	61	65	59	3	3
Classified euthyroid: known influencing medication.. ..	3	3	3	0	3	3	3	0	0	1	1	0	0	1
Classified hyperthyroid: known influencing medication	5	5	2	3	4	4	4	0	0	3	3	3	0	0
Total	8	8	5	3	7	7	7	0	0	4	4	3	0	1

dose. This is denoted by $(U_{25} - U_{15})$. The procedure adopted is to obtain as many uptake determinations as possible (usually about eight) during the period ten to thirty minutes, plot them as uptake against time, draw the best curve through them and read off the values of U_{15} and U_{25} from the graph. It is found that this minimizes the errors in individual observations.

Determination of the Forty-eight Hour PBI^{131}.

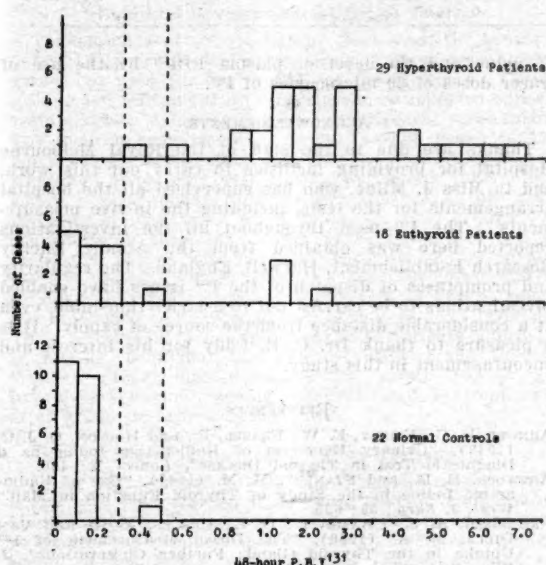The biochemical estimation of PBI in the blood plasma has been found by a number of workers to be a very

FIGURE VIII.

Distribution of the 48-hour PBI^{131} determinations in percentage of the dose per litre. (Note change of scale at 1·0% of the dose per litre.)

useful method of assessing thyroid function, but it is a difficult and laborious procedure, and a simpler alternative method is desirable for routine investigations.

Goodwin, Macgregor, Miller and Wayne (1951) carried out a comparison of seven physically measurable indices of thyroid function and found that the PBI^{131} in the blood plasma forty-eight hours after administration of the dose, expressed as a percentage of the dose per litre, was the best index of the group studied. The results obtained by these workers show that this index gives a very good separation between toxic and non-toxic patients. Generally their values for patients in a toxic state lie between 0·4% and 3·5% of the dose per litre, and those for patients in a non-toxic state are less than 0·2% of the dose per litre. In their method 10 millilitres of plasma were precipitated with 30 millilitres of 10% trichloracetic acid. The suspension was centrifuged and the supernatant liquid poured off. After two washings with trichloracetic acid the precipitated proteins were taken up in 10 millilitres of 2N sodium hydroxide and counted in a liquid counter. Tracer doses of 25 microcuries were employed, and specimens of plasma containing 0·4% of the dose per litre gave counting rates of the order of eight counts per minute above a background of twelve counts per minute.

With such a low order of counting the statistical error can be considerable; but in view of the good separation of the toxic and non-toxic groups obtained by Goodwin *et alii* (1951) it was decided to determine the forty-eight hour PBI^{131} values in the second series of patients.

However, the assay has been carried out with the use of three millilitres of plasma. The plasma proteins are precipitated and washed, as before, with nine millilitres of 10% trichloracetic acid; 0·25 millilitre of 10N sodium hydroxide is added and the mixture agitated with a glass rod until all the precipitate has dissolved. It is then transferred to a watch-glass one inch in diameter and dried under an infra-red lamp. The sample is placed at a fixed distance from a General Electric Company E.H.M.2 Geiger counter mounted in a lead castle, and the I^{131} content is determined by comparison of the counting rate from the sample with that from a standard source. This method gives a threefold increase in counting rate over the liquid counter method, only three millilitres of plasma being used instead of 10 millilitres.

Results of the Second Series of Tests.

With the reduction in the size of the tracer dose from 100 to 20 microcuries, it was considered safe to carry out I^{131} tracer studies on patients with no known thyroid dysfunction. The patients were volunteers and are referred to below as the normal control group.

During the period from July, 1952, to May, 1953, a total of 89 tracer studies were carried out by means of the new technique. These included 32 studies on normal controls, 25 on euthyroid patients and 32 on hyperthyroid patients. The results are shown in the form of histograms in Figures VII and VIII, and are summarized in Table IV, together with the k_1 results of the first series of tests.

The determinations of the forty-eight hour PBI^{131} value were not commenced for some weeks after the beginning of this second series, so the results for this index are fewer than for $(U_{25} - U_{15})$.

The results show that, for Melbourne, the value of $(U_{25} - U_{15})$ for patients in a toxic state is 5·0% or greater, and for those in a non-toxic state is 4·5% or less. It is considered that values between 4·5% and 5·0% must be regarded as uncertain. These limits have given eight wrong results and three uncertain results for 57 subjects classified as euthyroid or hyperthyroid, and no wrong results and one uncertain result for 32 normal controls. It is of interest to note that of the five euthyroid patients misclassified by this index, four were diagnosed as suffering from non-toxic colloid goitre, in which the uptake may be expected to be higher than normal.

The forty-eight hour PBI^{131} results are in fairly good agreement with the published data of Goodwin *et alii* (1951), although slightly different limits have been obtained in Melbourne. The results indicate that the forty-eight hour PBI^{131} value for patients in a toxic state is 0·5% or greater, and for patients in a non-toxic state is 0·3% or less. Values between 0·3% and 0·5% are regarded as uncertain. These limits have given four wrong results and two uncertain results for 47 subjects classified as euthyroid or hyperthyroid, and no wrong results and one uncertain result for 22 normal controls.

DISCUSSION.

The subjects studied in these series of investigations have not been specially selected, and they include a number of patients for whom classification has been possible only after prolonged observation.

The results indicate that both the initial rate of uptake of I^{131} by the thyroid and the forty-eight hour PBI^{131} value are useful aids in the diagnosis of hyperthyroidism. The technique causes minimal interference with accepted medical procedures and does not involve the admission of the patient to hospital.

The uptake rate factor proved to be the best physically measurable index in the first series of tests; and from the second series it appears that the forty-eight hour PBI^{131} gives a slightly better separation between euthyroid and hyperthyroid patients.

Although the number of tracer investigations reported here is not so large as in some overseas studies, the important feature is that comparisons of the various indices have been made on the same clinical material. In view of the wide variety of indices considered, both in the present study and in that of Goodwin *et alii* (1951),

TABLE V.
Comparison of Index Limits for Melbourne, Launceston and Sheffield.

Region.	$U_{25}-U_{15}$. (Percentage of the Dose.)			Forty-eight Hour PBI[131]. (Percentage of the Dose per Litre.)		
	Euthyroid.	Hyperthyroid.	Maximum Value Obtained.	Euthyroid.	Hyperthyroid.	Maximum Value Obtained.
Melbourne	<4·5	>5·0	11·4	<0·3	>0·5	6·7
Launceston	<6·0	>7·0	21·5	<0·4	>0·5	4·3
Sheffield	—	—	—	<0·2	>0·4	3·5

the forty-eight hour PBI[131] value appears to be the most accurate physically measurable index for separating the euthyroid and hyperthyroid groups.

The uptake rate ($U_{25} - U_{15}$) is only slightly less accurate, and can be determined within an hour after the intravenous administration of the tracer dose. The forty-eight hour PBI[131] result cannot be determined so quickly; but it is possible that the tracer dose could be given orally without causing appreciable variation in the toxic and non-toxic limits. However, this point would need to be tested on patients drawn from the same community. Goodwin *et alii* (1951) administered their tracer doses orally to fasting patients, and their limits are a little lower than those found for Melbourne (see Table V). This, however, may not be due to the different mode of administration.

A similar thyroid study is being carried out at the Launceston General Hospital in Tasmania, which is a goitrogenic area. Preliminary information, which is included here by the courtesy of Dr. John Grove, indicates that in Launceston different limits for ($U_{25}-U_{15}$) and the forty-eight hour PBI[131] value apply (see Table V).

Thus it would seem necessary for each centre to determine the toxic and non-toxic limits for the particular indices it is proposed to use. Both in Melbourne and in Launceston patients have been put on a diet of low iodine content for one or two weeks prior to the tracer test, in order that the test result should not be influenced by an abnormally high intake of iodine. In spite of this precaution, the limits for the two regions are significantly different.

Three tracer tests were also carried out on three hypothyroid patients referred for investigation. It is difficult to draw conclusions from such a small group; but it seems that the range of both the uptake rate factor and the forty-eight hour PBI[131] value for the normal and euthyroid groups includes such low values that the hypothyroid group cannot be distinguished by these indices. However, other indices determinable from uptake or excretion data may be more useful in this respect.

SUMMARY.

The usefulness of various indices of thyroid function as aids in the diagnosis of hyperthyroidism has been investigated.

The most accurate physically measurable index appears to be the level of PBI[131] in the plasma forty-eight hours after administration of a tracer dose of I[131], expressed as a percentage of the dose per litre.

A second index which has also been found very useful is the initial rate of uptake of I[131] by the thyroid gland, as measured by the percentage of the dose accumulated by the gland in the interval 15 to 25 minutes after intravenous administration of the tracer dose.

The toxic and non-toxic limits of these indices vary according to the region from which patients are drawn, and it seems necessary for each centre to determine its own limits before using the technique as a routine aid to diagnosis.

Neither of these indices is useful in the diagnosis of hypothyroidism.

A new technique is described which facilitates the determination of the I[131] content of the thyroid, the I[131] content

of urine and the level of plasma PBI[131] by the use of tracer doses of 20 microcuries of I[131].

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GROUP THERAPY: A REVIEW AND REPORT ON ITS USE IN A THERAPEUTIC COMMUNITY.

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GROUP THERAPY was defined by Richman (1950) as the treatment of a number of patients assembled for a therapeutic session, or as a planned endeavour to discover and control the forces which operate in a group.

Historical Development of Group Therapy.

The methods of group therapy were used for centuries before the psychological mechanisms involved were investigated and used for the therapy of the members. Church groups and military training groups have achieved opposite results while using analogous psychological mechanisms. The modern development of group therapy began in 1905 when Pratt (1922) established didactic class groups in the treatment of patients with chronic pulmonary tuberculosis. Lazell (1921) appears to have been the first to use group methods in psychiatry when he began class groups with schizophrenic patients. Marsh (1931) described activity discussion groups with psychotic patients. A big advance came in the 1930's when Schilder (1939) developed analytic groups. In recent years the application of group therapy has broadened as knowledge and techniques have developed. Thus, Silver (1950) has found geriatric patients improving in morale, behaviour and interest after group therapy. Wender (1950) has described the group morale and improved behaviour among insulin-treated schizophrenics after group therapy was instituted.

Psychodynamics of Group Therapy.

Freud (1922) commented on that "something that unites a group". He regarded it as being derived from mutual identification of the members with a common leader, with realization of common interests and objectives. Modern social psychologists describe this unifying bond as "cohesion". Group members state that it is a feeling of "belonging together". As a group becomes established and the cohesive bond develops, there is a profound alteration in the mental activity of the members. There may be changes in emotional feeling (affective state), in ideas, beliefs and attitudes (ideational processes), and in behaviour, all of which are usually regarded as being dependent on this process (mental mechanism) of identification between the members. It is a universal observation that individual similarities are accentuated, while individual differences are minimized and pushed into the background of the minds of the members.

Identification between the members is associated with a feeling of "oneness" and "strength" or security. This security and support alter the mental balance between (*a*) the ideas, feelings and actions that are permitted expression by the individual member's conscience, and (*b*) those that are denied conscious expression because they are unacceptable. This results in a change in the person's standards of thought, feeling and behaviour when he becomes a member of a group. It may be evident as conversion or religious awakening in a church group, or development of morale in a battle unit, or surge of lust and fury in a mob. In a therapeutic group it is evident as a gradual expression of ideas and feelings that the patient previously was not able to admit to himself, because they were associated with fear or guilt and shame. The support and reassurance of the group increase the secondary narcissism of the patients (through identification), thus breaking down repressive barriers. This temporary change, that allows the patient to remember events and thoughts and to recognize unknown urges and needs, is the focal point in all insight-producing psychotherapy. It is then that the patient begins to know why he feels the way that he does feel. In group therapy it is achieved by the supportive influence of the group, whereas in Freudian psychoanalysis it follows support from the analyst in conjunction with a gradual modification of part of the "censoring" function of his mind. The final therapeutic result, however, depends on the patient's ability to incorporate his newly acquired understanding of himself with the remainder of his personality, and with the actual circumstances of his environment. That is, it is still largely up to the patient to change his ways.

Complex interpersonal relationships can be detected in a group when cohesion has developed. These relationships are similar to those occurring in a family group as each member gradually adopts a role that tends to be constant in its relation to the roles of other members. Thus one man will contradict the therapist, or try to show off his superior knowledge in other subjects, while obviously appealing to the other group members to support him in his revolt against the psychiatrist who seems to him at the time to be similar to his father. He uses the permissive situation in the group to give vent to the resentment he felt towards his father. In patients who find themselves in childhood status and playing childhood roles, particularly when they are manœuvred into the role by other patients, there is sometimes a reactivation of anxieties and ideas experienced by the patient when he was first in this role in his earlier life. It is then that one detects interpersonal phenomena that resemble those of the family with its sibling rivalry, ambivalence to parents, displacement of emotional feeling from one person to another, and projection of ideas to other people. The group becomes therapeutic in the analytic sense only when the psychiatrist encourages this process and supports the patients as they reveal their ideas and feelings. Later, when sufficient material has been produced and sufficient emotion has developed, the therapist becomes more active, he halts the productive phase, and uses the cohesive ego-support of the group to help the patients understand the mechanisms they have been using and, if possible, some of the reasons why they found it necessary to react in the manner in which they have reacted. During this discussion phase of the session, in which the psychiatrist is leading the patients into interpreting their own behaviour, it is necessary for them to bring repressed ideas and feelings into consciousness. As this happens, the fear and guilt that have been responsible for repression become more evident. The patient tends to defend himself from this distress by using the mental mechanisms of repression, displacement or projection. Thus, the chief manifestations of "resistance" in group therapy are silence, changing the subject, and attributing ideas or feelings (usually hostility) to people outside the group. The atmosphere, or social climate, of the group is influenced by rising tension, fear or guilt in one member, and very frequently another member will respond with resistance. How is this group resistance overcome? That is one of the great problems, and one that is only partly understood.

Classification of Group Therapy.

The variable factors to be considered in designing a therapeutic group are as follows: (*a*) the type of patient, with regard to age, intelligence, developmental background and the nature of his psychiatric state; (*b*) the psychiatrist, his knowledge, training and personality; (*c*) economic factors of time available and the number of patients to be treated; and (*d*) the objective of the session, which may be to clarify the psychodynamic diagnosis, to screen patients for other forms of treatment, to provide emotional support during other treatment, or to produce insight and modification of the personality of the patient. Consideration of these factors reveals the great variation in the function of the psychiatrist.

Therapeutic groups are usually classified according to the relation between the function of the therapist and the activity indulged in by the group.

Mass Groups.

Large numbers of patients are provided with recreation and diversion such as community singing or dancing. Such group activities are used in the treatment of chronic

mental hospital patients and in therapeutic social clubs. The therapist functions by example and suggestion.

Class Groups.

In class groups the psychiatrist meets a group of up to 50 patients and conducts lecture-discussions. He presents the facts of a subject in a lecture, and attempts to lead patients to achieve intellectual insight by having them discuss the relation between the facts and their individual problems. Class groups are useful with patients suffering from similar conditions and have been extensively used in the treatment of psychosomatic disorders. The therapist imparts his facts in the hope of altering attitudes and reactions at conscious or near-conscious level. Interpersonal relationships are not very important. The therapist functions by suggestion and education.

Activity Groups.

Activity groups fall naturally into two types—namely, primarily creative and primarily ideational activity groups. The former are engaged in activities such as modelling, wood-carving, painting et cetera. There are eight to 15 patients in these groups. In the latter, the medium of activity may be play-reading, puppet plays, debating or general discussion. The therapist is usually a psychologist, nurse or occupational therapist. The method is similar with each activity, attention shifting between the activity and discussion of the patients' contributions, attitudes and reactions. During the discussion the therapist enhances cohesion and later encourages expression of ideas, either directly or indirectly through behaviour. The therapist functions through suggestion, example, and education. The interpersonal relationships of this type of group are much more akin to real life than those of the mass or class groups. Consequently, there is more stringent reality testing of new attitudes that impinge on the social climate of the group. The therapist controls the group by manipulation of the social climate. Creative activity groups are useful in treatment of psychotic patients and also of patients with the personality disorders that are associated with severe inhibition. In this department, ideational activity groups are used in the treatment of chronic neuroses and personality disorders. The psychodynamics involved in the therapeutic process concern, mainly, mutual ego-support by example from leaders and inter-member identification and cohesion. This lessens the anxiety and guilt associated with feelings and ideas that have been repressed or released through neurotic mechanisms, so that the patient can increase his activity, thus lowering tension and incidentally helping him gain better contact with reality. Interpersonal relationships develop, and these may fulfil patients' needs. Later, analysis turns the relationship to therapeutic advantage by giving the patient insight into the need, and the patterns of behaviour derived from it. It is considered that these activity groups are the most appropriate form of occupational therapy in the chronic neuroses and personality disorders. To set such patients to work individually accomplishes little towards reeducation of personality, whereas it can be seen how this may be achieved through the medium of activity groups.

Analytic Groups.

As in analytically orientated individual psychotherapy, the patient is helped to analyse his symptoms, behaviour and personality. This aim is presented to him as helping him to understand "why he is the way he is". The group situation then provides support as he tries out new ideas, attitudes and actions in a realistic situation. The level of analysis varies from development of insight into situations producing emotion, with its physical effects, to deep analysis of personality traits. In general terms, the indications and contraindications for analytic group therapy are the same as for individual psychoanalysis. There are some exceptions which will become apparent later in this paper.

Physical comfort and proximity are important, because relaxation and closeness enhance development of cohesion. Most therapists have varied frequency and duration of sessions, and most have concluded that one to one and a half hours three times each week is ideal.

Selection of patients to compose each group is important, for it is obvious that a group composed of patients with similar personality, age, intelligence and background will be able to develop cohesion more rapidly than a group of patients with little in common. Taylor (1952) stressed the importance of identification of each patient with other patients and the therapist. This is enhanced by selection of patients and careful planning of the role the therapist plays in the early sessions.

Management of the first session is directed towards development of cohesion which is analogous to rapport in individual psychotherapy. The therapist emphasizes similarities in symptoms, feelings and experience. He thus encourages the basic group activity of candid self-revelation and, by his own example, moulds the group reactions and standard of acceptance. Thus the therapist's basic activity, in the early sessions, is to encourage discussion and to understand the tensions within the group. Later, he indirectly manipulates these tensions through his own contributions.

The therapist's technique in later sessions is based on four main points. Firstly, there is the objective, which at any given moment is to maintain the optimum social climate for development of such interpersonal relations as may be discussed and understood by the group. Secondly, there are the media through which the therapist influences his group, which are as follows: affectively, by his expression, tone and manner; verbally, by his remarks; and by his posture, movement and gestures. Thirdly, there are the chief mechanisms used by the patients—namely, mutual identification and dependence, abreaction of anxiety and aggression, confession and expiation of guilt, displacement of affect, projection of ideas and affects to people in the group and outside it, repression, and reaction-formation when the patient emphasises the opposite attitude or idea to his genuine attitude or idea. Fourthly, there is the essence of the therapeutic process which has been described earlier.

Problems are frequently met with in therapy with an established group. (a) There is often some difficulty in securing incorporation of a new member. This is best achieved by arranging for an established member to introduce the newcomer and to explain to him what happens in the sessions. If this duty is rotated, the therapist can keep the group attitude to treatment under observation and control. (b) It is always difficult to keep fully abreast of the underlying tensions in the group. Probably it is best to say and do nothing till the situation declares itself, as it ultimately will. (c) When one or two patients present information and respond to partial interpretation more rapidly than others, it is difficult to regulate the rate of development of the discussion so that all members can be involved in it. (d) The manifestations of resistance have already been described. It is managed by letting it develop until there is a sign that one or two patients have detected the change. The conversation is then directed to these patients—perhaps only by gesture—and they may then bring the discussion closer to solution of the problem causing resistance. Before insight is eventually achieved it may be necessary to manœuvre the discussion indirectly to it through several approaches, meeting resistance in each. Many established groups "get into a rut" that is bounded by conscious rationalization and resistance. This happens very rapidly when intelligent obsessional patients dominate the discussion, because displacement is a main defence mechanism in this neurosis. When this happens it is necessary to introduce a "catalyst", which is essentially a stimulus to conscious phantasy-formation from unconscious or preconscious images. Films, psychodrama and music have been used as "catalysts". Music has proved the most useful of these. Unfamiliar orchestral music, without a dominant instrument and without too rigid and obvious form, is most productive. While a few chosen recordings are played, the patients are asked to draw sketches representing the thoughts and phantasies that spontaneously come into consciousness as they listen. They are told that their opinion of the music is not wanted, and

that the quality of the drawings is immaterial. They are asked not to use words, but to draw. This elimination of verbal symbols seems to allow more free recall of phantasy. As would be expected with such an unstructured and ambiguous projective technique, the drawings and phantasies are most diverse. They have a really catalytic effect on the discussion. (e) The problem of when to make interpretations to the group is not difficult if the therapist remembers that it is impossible to teach insight. On the other hand, it is frequently impossible to lead the group into making interpretations for themselves. When this happens it is best to lead the discussion gently by adding explanatory comments to those of the patients, thus gradually making a partial interpretation. The patients will sometimes accept this lead. An alternative method is to reflect back to the group the affective component of what is said, as in the Rogers (1942) technique of counselling.

The relation between group and individual psychotherapy is simple. The aims are the same, the techniques are analogous, and neither need exclude the other. Probably most patients can be treated with either method, or with both methods concurrently, if the group is carefully designed. Klapman (1950) described his technique of "shuttling" patients between the individual and the group situation. He found that many events that were masked in one were clarified in the other; for example, resistance in an interview shows up more clearly in the group. Similarly, aggression aroused by narcissistic frustration in the group can be analysed individually.

There is possibly another advantage in group therapy—namely, the chance of exploiting the group situation and its mechanisms to increase genuine motivation towards recovery. Motivation is discouragingly lacking in many of the chronic neuroses and personality disorders that are ordinarily considered unsuitable for insight-producing psychotherapy. Such patients present very frequent therapeutic problems and failures. In a government medical service they still must be cared for, and many of them are aware of this. The group situation seems to offer one means of getting them to make some effort, even with the prospect of losing a comfortable symptom and useful material secondary gains.

Wolf (1952) inter alia summarized the objections of orthodox Freudian psychoanalysts to group therapy. Firstly, it is not an individual situation, though it has been demonstrated that the group situation has its own intrinsic advantages; secondly, there are technical difficulties in management; and thirdly, there are possible dangers to patients "exposed" to group methods. Dangers described are excessive dependency, increase in symptoms and precipitation of psychosis. These dangers are minimized if patients are carefully selected and placed in a carefully designed group.

The chief relative contraindications for analytic group psychotherapy are agitated depression, severe chronic anxiety state, mental deficiency, appreciable mental deficit due to arteriosclerosis et cetera, chronic incipient schizophrenia, psychopathic personality, and severe tension states associated with reaction-formations overlying repressed homosexuality.

Psychodrama.

While there are many types of psychodrama, we have mainly used a type that is an adjunct to group therapy. A problem appears in a group and is considered for the subject of a drama because of unmanageable resistance, or because it seems applicable to a number of patients. The patient-author and therapist together work out a one, two or three scene plot around the problem. They prepare a "briefing sheet", which consists of a statement of the problem and a brief statement of the personality and attitude of the people concerned. They then select as actors patients and staff whose personalities most closely correspond to the parts they are to play. These players are then briefed, quite shortly. Usually the script consists of one opening line; for example, a wife says: "So you're home late and drunk again."

The action goes on spontaneously for ten to twenty minutes and is followed by one to one and a half hours' discussion that is permissively directed by the psychiatrist. Sometimes a drama is designed to produce abreaction, sometimes to produce insight into one particular patient's symptom; for example, a patient may be put into the same situation as produces his dyspepsia or headache or faint—and the symptom is produced as a result.

Therapeutic Communities.

Maxwell Jones (1952) defines a "therapeutic community" as a hospital community where the activities of the patients' entire day are thought of as being part of the treatment situation. This implies that all the hospital staff, with whom the patients come in contact, have a therapeutic role to play and have had adequate training for that role.

A therapeutic community is developed on the concept that both the staff and the patient population of a hospital tend to differentiate into groups. This differentiation is usually spontaneous, but it may be directed in accordance with therapeutically useful criteria. The groups to be managed are composed of (a) patients only, (b) staff and patients, and (c) staff only. Each individual in the community belongs to several groups and moves from one to another disseminating ideas and affect. In 1943, Maxwell Jones developed a therapeutic community at Mill Hill Emergency Hospital, England, where patients, suffering from effort syndrome, were treated by class group methods. The concepts were further developed at Southern Hospital, Dartford, where ex-prisoners of war were treated by didactic class and other group methods. In 1947, Maxwell Jones established a third therapeutic community at the Industrial Neurosis Unit of the Belmont Hospital, Sutton, where chronic unemployed neurotic patients were segregated and submitted to active treatment programmes. The Cassell Hospital for Functional Nervous Diseases in Surrey, England, is a fourth therapeutic community. Here the patients are undergoing individual psychoanalysis in addition to the group activities in the community. Kaldeck (1951) described a comprehensive group therapy organization that is analogous to a therapeutic community in a mental hospital. He used nurses and attendants as therapists in activity groups, maintaining control by weekly seminars with the therapists.

Report on the Therapeutic Community at "Rockingham".

The community at "Rockingham" was begun in January, 1951, in a preexisting Red Cross Convalescent Home for patients with chronic personality disorders and remitted psychosis. In two years it has become a well-developed community that has proved effective in the treatment of chronically ill patients who have not responded to other more common forms of psychotherapy.

Patient Population.

Fifty to sixty males live at the hospital. These men are receiving treatment for psychiatric disorders which have been accepted by the Repatriation Department as due to, or aggravated by, war service. Patients are admitted from the care of general practitioners, from the Repatriation psychiatric out-patient clinic, and from the psychiatric wards at the Repatriation General Hospital, Heidelberg. Most of the patients have had extensive contact with the Repatriation Department. The period spent in hospital varies considerably. A big proportion of patients improve within four to six weeks, and some are discharged improved after three months, while a few patients undergoing deep psychotherapy may remain in hospital for nine months, though these are exceptional. As our understanding of the psychodynamics of the therapeutic process in group therapy has increased, we have been able to detect patients not likely to improve under these conditions and have transferred them to other more appropriate forms of treatment. This has considerably shortened the average duration of stay in hospital.

Staff Population.

There are two full-time medical officers, one half-time psychiatrist, two visiting consultant psychiatrists, one visiting physician, two visiting psychologists, two qualified occupational therapists, five occupational therapy technicians, three nurses, three house officers or orderlies, and the usual domestic and maintenance staff. In addition, a psychiatric social worker, and an educational and employment officer are available as required.

Chronological Development.

Prior to January, 1951, treatment consisted of individual psychotherapy and occupational therapy. For some months there was a small, highly selected group of patients who received an essentially non-directive form of group therapy. The patients' attitude was almost entirely passive, as they believed they were in hospital to be treated by the department and entertained by auxiliaries. The many instances of mildly anti-social behaviour that occurred almost daily in the hospital can be taken as an index of the attitude of the patients to treatment. In an attempt to improve matters, the structure of a "therapeutic community" was established in the following manner. A meeting of the patient-staff population was held and the basic concepts were explained and interest and cooperation established. The patients then elected a "wards committee" of eight (two patients from each ward) to meet once per week; each patient remains in office for four weeks. The committee was made responsible for organization of the patients' contribution to the running of the institution, for the presentation of ideas, suggestions and complaints, and to some extent for general cooperation by the patient body. The psychiatrist attends these meetings, adopting a very passive role, and does not vote.

A recreational therapy committee was established and six patients were elected to it. An occupational therapist attends all meetings of this committee, which meets weekly and is responsible for the arrangement and execution of a recreational programme. In addition, a weekly patient-staff meeting was established. The chairman is the president of the patients' ward committee. It provides a medium whereby anyone may introduce new ideas. Discussion of their worth follows and the patients vote on the adoption or otherwise of such new ideas. Staff vote at these meetings only at the express invitation of the patients. In this way responsibility is passed on to the patients, who come to take a much more active part in the management of their affairs. Staff members enter into the discussions, and are usually able to ensure that only reasonable suggestions are adopted.

By May, 1951, the "social climate" of the hospital had improved considerably — that is, the community had changed the criteria by which attitudes and behaviour would be approved or rejected. However, it was apparent that there was a big proportion of patients who had not fallen in with the change, but had differentiated into a fairly distinct group or aggregate of groups that maintained the old social climate. The attitudes and behaviour of this group were clearly anti-social to the developing nucleus of the therapeutic community, which at that time was composed of staff and committee members. Considerable tension developed between members of the two factions, and discussion in the patient-staff meeting was only partially able to relieve this because there was little similarity of attitude and standards. It was possible to detect the beginnings of rigid bias and prejudice that could not be broken down by discussion. It thus became clear that to institute only the structure of a therapeutic community is insufficient to attain optimum results. Group therapy was, therefore, established to bring members of this anti-social group into closer psychological contact with the community leaders. Psychodramas were introduced at the same time to provide a medium for acting out of tensions rather than mere discussion.

Interpersonal Relationships in the Community.

Interpersonal relationships within the community are complex, but an attempt can be made to describe some of the determinants which have become apparent. At the risk of appearing dogmatic, but in the interests of brevity, the following observations and conclusions can be presented.

1. A patient's attitude to another patient will be influenced by his neurosis—that is, by the mechanisms he uses to minimize his anxiety, and by his needs; thus a patient usually seeks out as friends patients who supply what he unconsciously wants. Because of projection, his enemies are often people with similar troubles to his own unconscious conflicts, because he feels hostile towards people who evoke his own anxiety.

2. A patient's attitude to staff members is determined by: (a) his interpretation of the role of the staff members, which depends on his previous experience with others in similar positions, and applies especially to psychiatrists and house officers and clerical staff; (b) his interpretation of the function of the institution—as a rest home or a hospital; (c) his identification of the staff member with someone unconsciously represented in his mental conflicts; (d) his attitude to secondary gain—bluntly, whether he prefers his health or his pension or whether, as one patient put it, "it is easier to be sick than well"; (e) the example set by leader-patients; and (f) how far the staff's attempts to push him into community affairs activate or diminish his underlying needs and frustrations.

3. Staff attitude to patients is governed by similar factors. We have found repeatedly that untrained and inexperienced members of the staff have developed relationships with patients along the same lines, and probably controlled by the same factors as control the interpersonal relationships of the patients. Therefore, training has been directed towards helping staff members to understand the psychopathology of neuroses and, as far as possible, develop insight into their own personalities and needs. This has enabled as many unconscious factors as possible to be controlled. Closely related to this is the staff member's perception of his own role. It is not impossible that a staff member could use his job to fulfil his own unconscious needs.

4. Interstaff relationships have at times been difficult. Under ideal circumstances, most of these could be managed by selection of staff with mature and adequate personality and good capacity for insight into their own problems. Example from the community leader is crucial. A lethargic leader engenders lethargy in his staff; a martinet, who is over-compensating his own feelings of inadequacy, gets no close rapport with his staff, but stirs tension and aggression, which rapidly reaches the patients. It is continually surprising to note the speed with which staff disharmony disrupts the atmosphere of a group of patients. Points to be watched continually are the over-assertion of authority, vacillation of attitude without explained cause, failure to understand the role to be assumed in a particular situation, unequal recognition and appreciation of efforts and results, and failure of one person to understand the importance and role of others, and the tendency to brood over frustrating misunderstandings. Regular staff group meetings provide a medium for overcoming most of these difficulties.

There is a natural unconscious tendency for staff to manipulate the interpersonal relationships within the community, to prevent occurrence of situations that will produce anxiety and tension in the patients (and in themselves). The resulting happy atmosphere is very pleasant. However, if staff members are trained to maintain a consistently reasonable attitude in all situations, and to control their own emotionally-determined responses to patients, many situations will develop in which the neurotic reactions of patients will be apparent. These situations and reactions can then be discussed with the patient, the psychiatrist helping him develop insight into his neurotic reaction.

For example, a patient recently asked a sister for his medicine at an inconvenient time. He was politely asked to wait a few minutes. He responded with a display of temper that was quite excessive, having regard to the trivial nature of the frustration. When hypnotized, this man revealed he had been a ward of the State from the age of

six years till he was twelve years old. He sadly missed the affectionate protection of his mother and naturally was resentful to the women who filled her place in the institution and were unable to give him the love he needed. He responded to the sister with all the anger he felt to her counterpart in his earlier life. The patient thus gained insight into the cause of this neurotic reaction, and became able to control his behaviour. The reasonable attitude of the sister resulted in a neurotic reaction that would not have occurred if the patient had been appeased in the interests of harmony.

Thus it can be seen that a hospital for the treatment of neurosis must not increase the patient's inadequacy in coping with his environment by becoming a "Shangri-La". It must be orientated towards preparing him for adequate adjustment to the obligations of his environment. This is achieved by helping him handle the stresses he meets in a realistic "therapeutic community".

Relation between the Therapeutic Community and the General Community.

It is possible that the rather complex differentiation and extensive, though indirect, control of a community such as this could lead to an unwanted segregation from the general community. This would be an inevitable result if steps were not taken to bridge the gap that tends to isolate the environment in hospital from the unsympathetic and, to patients, seemingly stark realities of the outside world. A therapeutic community would lose its usefulness if it ceased to be strictly a reality testing ground. Likewise, the effectiveness is enhanced if patients can feel that there is a transition between being in hospital in ideal circumstances on the one hand, and being out of hospital with only their own resources on the other. The therapeutic community can be kept in close relation to the general community by the staff leaders carrying out duties away from the hospital, and living away from it; by the encouragement and the provision of freedom of access for outside visitors; by controlled use of patients' leave of absence to their homes; by provision of group discussions for relatives; by ensuring that occupational therapy and recreational therapy projects are realistic, as distinct from flights from the needs of reality. At "Rockingham", occupational therapy is orientated towards teaching the patients skills that will be of use in their homes—for example, french-polishing, boot-repairing, gardening and general maintenance and metal-work and wood-work.

It is important also to establish a really effective liaison with employment agencies, personnel officers in private firms, and employers. With good use of these facilities, it has been found possible to maintain a realistic, as distinct from a fanciful or theoretical, attitude among the patients, and just as important, among the staff.

Discussion.

It may be queried whether many patients improving under a régime such as this would not have improved anyway. It must be conceded that they probably would. This commonly held belief that most patients suffering from psychoneurosis would eventually recover spontaneously implies that there is a natural tendency to return to normal. This presupposes that Nature controls the psychological events that take place after a pathogenic event and that these events are purposively directed towards normality in a manner analogous to the events usually regarded as "inflammatory reaction" to physical trauma. Such an opinion savours more of belief than scientific conclusion, because there is really very little evidence as to whether "psychological" or "pathological" events occurring after trauma are purposively orientated or otherwise.

As far as practical medicine is concerned, this problem is not of direct importance, provided the events are known and treatment is designed to facilitate the "recovery process" and prevent interference with it. It is no more justifiable to withhold appropriate psychotherapy than to withhold appropriate physical medicine, if the treatment will alleviate distress.

When a patient, who may or may not be about to recover spontaneously, is admitted to hospital, three changes occur. He receives such physical treatment as is indicated; he leaves a complex environment; he enters a new complex environment which may or may not include harmful factors. It follows that, for treatment to reach maximum effectiveness, the significance of these factors must be elicited and treatment designed accordingly. The usefulness of the "therapeutic community" lies in the fact that it brings the third of these changes out of the realms of chance, and at least makes possible some measure of control of the treatment the patient receives when he is out of the doctor's office.

Results.

It is notoriously difficult to obtain quantitative assessments of change in psychological conditions. Many attempts are made which are of dubious validity, because we have no unit, no measure, and no base-line with which to compare a patient's anxiety, depression, schizophrenic thought-disorder or social maladjustment. Likewise, when many forms of treatment are used simultaneously but in varying ways, it is difficult to assess the significance of any one treatment. Even such a rough criterion as the incidence of readmission to hospital after an interval is of doubtful validity, because out-patient facilities have been extended, and because many patients have been managed at home by relatives, who have received instruction through the out-patient clinic. The rough criterion of duration of stay in hospital is meaningless, because the additional data that become available during a few weeks' group therapy frequently bring to light a need for hours of individual psychotherapy that would not have been detected otherwise. For these reasons, statistical results have not been computed.

The clinical impression of all concerned with the therapeutic community is that it improves the standards of behaviour in the hospital, it is an excellent medium for teaching staff, and it has, in most cases, facilitated individual psychotherapy by increasing motivation.

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A METHOD OF INDUCTION OF LABOUR IN PREECLAMPTIC TOXÆMIA AND HYPERTENSION OF PREGNANCY.

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THE purpose of this communication is not to discuss minutely the classification of preeclamptic toxæmia or its medical treatment, but to describe a technique for induction of labour in some of these cases.

The term "preeclamptic" is not an ideal one for patients suffering from raised blood pressure, œdema and albumin in the urine, for eclampsia is a most unlikely sequel, especially for those who regularly attend ante-natal clinics and are admitted to hospital as soon as the early warning signs of toxæmia appear. However, the name does point a warning finger to the worst sequel of toxæmia of pregnancy.

As a result of generally improved ante-natal care the fulminating preeclamptic case is becoming rarer, and in this type of case surgical induction of labour would be time wasted and would jeopardize the life of the mother and baby. Cæsarean section is the solution in this extremity.

Now the common case we are faced with in hospital is that of the expectant mother, not yet past the thirty-sixth week, who is failing to respond to conservative treatment—that is, failing to return to a normal blood pressure and to become free from albuminuria and œdema. She may be classified on her admission to hospital as (a) a preeclamptic or (b) a hypertensive with or without super-imposed toxæmia. Whatever the classification may be, more important is a careful day-to-day assessment of the patient, a watch being kept on her blood pressure, the amount of albumin in the urine and the response to treatment.

As a routine procedure it is our practice, apart from the usual examinations, to carry out the following investigations: (i) In *primiparæ* and in *multiparæ* with a history of dystocia, radiological pelvimetry is performed. This confirms the presentation and position of the fœtus and gives an approximate estimation of its age, besides forecasting the type of labour to be expected. (ii) A pyelographic examination is carried out in cases in which there is a history of kidney disease. (iii) The eye grounds are examined weekly. (iv) Blood urea and uric acid estimations are made. (v) The state of the cervix is particularly noted on the patient's admission to hospital.

The usual standard régime of quiet, bed rest, sedation and a salt-free diet of high protein content is commenced on the patient's admission to hospital. Blood pressure, albuminuria, weight and urinary output are carefully watched and tabulated. When œdema is obvious, for the first few days the now well-known milk, eggs and rice diet is used as a routine (Mayes, 1950).

The whole aim of assessment of every shred of evidence concerning the expectant mother's daily progress under treatment is to let the mother mature the fœtus to the thirty-sixth week of fœtal life, while surrounding them both with all possible precautions. Nevertheless danger exists and if, for reasons of prematurity with all its hazards, the obstetrician temporizes too long, then any of the following may happen: (i) eclampsia, (ii) fœtal death *in utero*, (iii) accidental hæmorrhage.

Eclampsia in a patient undergoing treatment in hospital is nowadays indeed a rarity, with alert modern care. But accidental hæmorrhage and fœtal death *in utero* give no warning and may happen in spite of the finest treatment.

It may well be judged better to have a live three-pound baby that may survive than a still-born five-pound baby. But every obstetrician does not breathe the same climate of opinion in this.

When should the decision be made to terminate pregnancy? How should it be done?

If the pregnancy is at or after the thirty-sixth week, and the baby is of corresponding maturity, a decision based on the state of the cervix should be made to terminate pregnancy.

If the condition of the cervix is favourable—that is, if it is at least half or more effaced, one to two centimetres dilated, and in the pre-axial or mid-axial position, and if the head is just at the level of the ischial spines—surgical induction of labour by rupture of the membranes is a safe, efficient and almost certain method. There is nothing to be gained by delay.

If the condition of the cervix is unfavourable, there is much to be gained by making it favourable.

Before the thirty-sixth week of pregnancy it has been a custom for some, and a rule for others, to wait fourteen days before deciding to induce labour. A patient who has toxæmia at the twenty-eighth week and whose condition is no better at thirty weeks, presents a hard case to which to apply this rule. She is unlikely to reach thirty-six weeks and produce a baby that survives.

There are a few patients with slight albuminuria and a blood pressure that remains normal at rest, who may be kept in hospital for many weeks until the thirty-sixth week is reached. Unfortunately time and the tide of toxæmia wait for no man, and termination of the pregnancy can become manifestly unavoidable at any time. For this emergency we may prepare the cervix to increase the chance of birth *per vias naturales*.

Cæsarean section, even in *multiparæ*, has sometimes been chosen to terminate pregnancy, on the grounds that the condition of the cervix is unfavourable, and therefore surgical induction would end in failure to initiate labour. Moreover, incoordinate labour of long duration is not uncommon if the condition of the cervix is unfavourable. This type of labour is dreaded for the following reasons: (i) the toxæmia may become worse; (ii) intrauterine infection of the fœtal lungs may occur; (iii) if the condition of the cervix is unfavourable, and if rupture of the membranes is performed without preparation of the cervix, the fœtus is driven down upon the unyielding cervix, and then the uterus with strong contractions may compress and kill it. A long latent interval, with the uterus not primed for labour, has the same effect. It is no wonder that Cæsarean section is performed with these dangers always present; but Cæsarean section does not guarantee that a premature baby will survive.

THE METHOD OF INDUCTION OF LABOUR.

In the preeclamptic type of case under discussion I believe that the first step in the induction of labour is taken some days beforehand, by preparation of the cervix, to prime the uterus for the onset of labour. After this one may proceed to further provocation and acceleration of labour, by full stripping of the membranes or by rupture of the membranes.

The procedure recommended for preparation is that of daily digital dilatation of the cervix until it just admits two fingers, combined with a limited local stripping of the membranes of the lower uterine segment. In all, three or four days may elapse before this procedure is complete.

A routine antiseptic and aseptic technique is followed as for a vaginal examination during labour. The patient lies comfortably supine in bed with the legs flexed. Care is taken not to fill her with apprehension, and throughout the procedure gentle reassurance should be given.

The gloved forefinger and middle finger, lubricated with "Dettol Cream", are passed into the vagina and the fornices carefully palpated. The fœtal head is ballotted, a vertex presentation is confirmed. The mind's eye travels to the fingers' ends to form some estimate of the thinness or effacement of the lower uterine segment. If ballottement of the head is difficult through thick cushioned fornices, there is little effacement; but if the head can be palpated through a lower uterine segment which gives the impression of being paper-thin, then it is fully effaced. This estimate is later confirmed when the forefinger has, in favourable cases, passed through the internal *os uteri*. It is then between the wall of the anterior segment of the lower uterine segment and the inner surface of the *symphysis pubis* that this thinness is fully appreciated.

Assessment of the Cervix.

The condition of the cervix is assessed from the following points of view: (i) length, shape and consistency; (ii) dilatation of the external os; (iii) position of the cervix in relation to the pelvic axis and the plane of least pelvic dimensions.

Length, Shape and Consistency of the Cervix.

From the thirty-second week the length varies from two to three centimetres. When it is one centimetre or less, the cervix is becoming favourable to induction of labour. The long conical or "tapir-nosed" cervix is a great rarity. Does it exist at all except in patients with a history of an operation for retroversion of the uterus?

The examining finger can define many variations in shape, depending on parity and duration of pregnancy. Rarely the cervix may be the size and shape of a nipple or merely a small depression. It may be rosebud-shaped or like thick pursed lips. At its best, in the last fourteen days of pregnancy the cervix is flattened and the external os rim feels curved like a knife-edge and readily admits one finger in *primiparæ* and sometimes two fingers in *multiparæ*. The cervix has now lost its individuality of shape and has merged into the lower uterine segment. The os is then a hole into the grand uterine cavity.

Dilatation of the External and Internal Os.

In some *multiparæ*, as early as the twenty-fourth week, the patulous external *os uteri* will admit the finger to the internal os. After the twenty-eighth week the external os admits the finger in *multiparæ*, but rarely in *primiparæ*, as far as the internal os.

After the thirty-second week the cervix commences to become effaced and flattened out, and if the finger can be passed through the external os and cervical canal, it feels the internal os as a circumferential ridge just at the tip of the finger. In the *multipara* this ridge usually is not clearly defined.

From the thirty-sixth week, when the increased succulence of the cervix permits the index finger to pass through the external os more easily, the internal os is taken up. The circumferential ridge is commencing to flatten and be incorporated into the lower uterine segment. In the *multiparæ* two or even three fingers may be passed through the *os uteri* into the formed lower uterine segment with the now effaced cervix.

Position of Cervix in Relation to Pelvic Axis.

The position of the cervix in relation to the pelvic axis is important as a guide to the probable progress of labour. Before the thirty-sixth week the cervix is pointing down the axis of the pelvis in *primiparæ*, usually at the plane of least pelvic dimensions. After the thirty-sixth week it may point, or rotate in its orbit to point, to the introitus. The examining extended forefinger seems to impinge on the external os as soon as it has passed the lower border of the *symphysis pubis*.

The "Sacral Os" or Post-axial Cervix.

The cervix in a small percentage of my cases (in my series 2%) may point unfavourably to the hollow of the sacrum, behind the pelvic axis, and lie just above the plane of the least pelvic dimensions—that is, not in the line of the axis of extrusion. Should it not rotate forward in the last four weeks or not be artificially assisted to do so, then dystocia may occur. This becomes more likely if this "sacral os" is associated with a posterior position of the fœtus, for then the head bears unduly upon the anterior segment of the lower uterine segment.

THE PROCEDURE.

When the cervix has in this way been carefully examined, it is called "favourable" or "unfavourable", "ripe" or "unripe".

By a favourable cervix we mean one that is at least half effaced and admits two fingers. If it is not favourable, as is commonly the case before the thirty-sixth week of pregnancy, and not uncommonly after the thirty-sixth week, it should at least be prepared to two fingers' dilatation if surgical induction of labour is under consideration.

The tip of the index or middle finger is pressed slowly and gently through the external *os uteri* to the internal os, where firm resistance is offered by its circular sphincter-like muscle (Hughesdon, 1952). The sensation imparted to the finger-tip may be that of a tense loop of string or a firm, rolled edge. This resistance at the internal os may be surprisingly absent, even as early as the thirty-second week of pregnancy. The resistance yields to insistent gentle pressure by the finger-tip, and then the finger feels the membranes. Ballottement of the head is carried out through the membranes. The fixed finger passes in to the extent of the first phalanx, and describes circular sweeping movements, separating off circumferentially the membranes from the lower uterine segment. When this has been done the finger is withdrawn. We have named this a "minor stripping".

The dilatation of the internal os that has been gained does not contract back to normal closure, as would, for example, the anal sphincter after digital dilatation, for the *os uteri* muscle retracts and stays retracted. The next day further retraction is gained by digital dilatation, and this continues until two fingers' dilatation is reached. When this has been achieved the internal os begins to feel like the circumferential ridge of the mature, favourable cervix, previously described.

In addition, in this area of stripping the membranes are loosened, to bulge into the *os uteri* as the segment of a sphere, and lend their mechanical aid.

The fœtal membranes are so constructed as to withstand pressures which exceed those due to the uterine contractions of labour. Premature rupture of the membranes has not occurred accidentally as a result of this preparation of the cervix.

The advance of the ovum (that is, forewaters and/or presenting part) favours the opening of the cervix from above by relaxing the tension of the circular muscle around the internal *os uteri*.

If by one's manner and gentle manœuvres the patient's cooperation and relaxation are won, then there is little discomfort. If discomfort is severe and pressure pain is felt, the procedure may be abandoned and tried again the next day, with sedation or analgesia (that is, nitrous oxide and oxygen or "Trilene"). No force should be used other than gentle but firm insistent digital pressure. One finds that, even in a mildly apprehensive *primipara*, the third effacement up to two fingers' dilatation can be free from acute discomfort.

Approximately twenty-four hours later the whole procedure is reenacted; but this time one discovers that the forefinger and perhaps the middle finger may be insinuated. It is noteworthy how much softer and more freely lubricated with mucus is the cervix than at the first examination. If the middle finger cannot easily be inserted, stripping to a minor degree is carried out with the forefinger again. At the third minor stripping it is usually possible to gain dilatation to admit two fingers. Rarely is a fourth manœuvre required. The time taken in each minor stripping is at the most five minutes.

Why wait twenty-four hours between effacements? If there is time, this delay is valuable, for the bulging membranes and the relaxed lower uterine segment release an "insensible labour", with the body of the uterus acting in harmony, causing the cervix and lower uterine segment to become even more effaced in this interval.

After three such procedures the cervix is "ripened" or "primed" for action, and the uterus will start to contract should the membranes be deliberately stripped high or ruptured. And so, with the cervix thus prepared, the patient is transferred to the labour ward. There, in the lithotomy position with light anæsthesia a high stripping of the membranes is performed by the middle finger or a high or low rupture of the membranes with an instrument. For the high rupture a Drew-Smythe catheter is used, for the low rupture, tenaculum forceps or single-toothed long Kocher's forceps.

If, after an interval of an hour, no uterine contractions have occurred spontaneously, then three minims of "Pitocin" are injected subcutaneously every half-hour up to five injections. When contractions commence the injections are stopped. It is rare for the full course of "Pitocin" to be used or repeated.

Frequent blood pressure readings are taken and the urine is tested.

If after rupture of the membranes labour fails to commence, then further delay may become dangerous, to either the mother or the baby or to both. The entire problem should be reviewed carefully and attention given to the desirability of Cæsarean section.

RESULTS.

Between June, 1951, and June, 1953, 221 public hospital patients suffering from preeclamptic toxæmia were under my care. Their ages were as follows: under twenty years, 11; twenty to twenty-nine years, 149; thirty to thirty-four years, 31; thirty-five years and over, 30. As one would expect, the greatest number belong to the most fecund age.

Of the patients, 90 were *primiparæ* and 131 were *multiparæ*.

The methods of delivery were as follows: spontaneous labour, 106 cases; induction of labour, 104 cases; Cæsarean section, 11 cases. The high proportion of labours starting spontaneously indicates that preeclamptic toxæmia is most common in the last two or three weeks of pregnancy.

Lower uterine segment Cæsarean section was performed for the following reasons. One patient required a second Cæsarean section, one patient was suffering from *diabetes mellitus*, one patient had a contracted pelvis, one elderly *primipara* had severe hypertension, in one case fœtal distress was present after artificial rupture of membranes, one patient had a prolonged labour with constriction ring dystocia, and five patients had fulminating preeclampsia. The patient with constriction ring dystocia was admitted to hospital in early labour, the membranes having ruptured prematurely. In the case of fœtal distress after rupture of the membranes no cause was found at operation; labour had been in progress for six hours.

Method of Induction of Labour in 104 Cases.

Medical induction of labour was used in two cases, major or high stripping of the membranes was performed in 45 cases, and high or low rupture of the membranes was performed in 57 cases. Of these 104 patients, 60 had the cervix prepared or "primed". The remainder had a cervix judged to be favourable. Twenty patients were prepared before the thirty-sixth week in pregnancy. The cervix was not prepared in any case by laminaria tents, by Jacques bougies, by stomach tubes, by balloons or by any other article—only by the digital method previously described.

Routine administration by subcutaneous injection of "Pitocin" (three minims per dose for five doses) was repeated in seven cases, when, after an interval of eight hours, labour had not commenced. Of these cases, in five the membranes had been stripped. (Three of the patients had their membranes stripped again.) In the remaining two the membranes had been ruptured.

Ten of the 102 cases in which labour was induced have been excluded because of unsatisfactory time recordings. The two medical inductions of labour were also excluded.

The analysis of available time records shows that there was no appreciable difference in the latent interval times of those cases in which the cervix was prepared and those in which the cervix was considered favourable.

Duration of Labour.

All patients were delivered within twenty-four hours, with the exception of three who developed incoordinate type of labour. It is interesting to note that these three patients whose membranes were surgically ruptured had had no preparation of the cervix; in the first of these cases the duration of labour was thirty hours, in the second it was twenty-nine hours, and in the third it was thirty-five hours. In the second case the baby died after birth, from anoxæmia. The other two babies survived.

Methods of Delivery per Vias Naturales.

Of the cases in which natural delivery occurred, in 40 forceps were required and in seven the presentation was by the breech. There were four twins in the series, all of whom survived.

Puerperal Morbidity.

For all public patients admitted to hospital in the period from June, 1951, to June, 1953, the rate of notifiable cases of puerperal pyrexia due to infection of the genital tract was 3·47%. Among the 221 patients treated as described there was no infection of the genital tract.

Maternal and Infant Mortality.

There were no maternal deaths among the 221 patients treated. Eight of the infants were lost; two were still-born and six died in the neonatal period. Of the total neonatal deaths, prematurity accounted for four. The total fœtal loss in 104 cases of induced labour was as follows: after induction of labour by rupture of membranes, two deaths; after induction of labour by stripping of membranes, one death.

TABLE I.

Surgical Induction of Labour.	Number of Patients.	Latent Interval After Induction of Labour.			
		Two Hours.	Six Hours.	Twelve Hours.	Twenty-four Hours.
Major or high stripping of membranes only	13	7	1	2	1
Major or high stripping of membranes, cervix prepared	27	10	11	6	0
Rupture of membranes, high or low only	19	13	2	1	3
Rupture of membranes, high or low after cervix prepared	33	20	5	7	0
Total	92	50	19	16	4

Comment.

These statistics are a brief analysis of results and serve to indicate the usefulness of assessment and preparation of the cervix.

SUMMARY.

A method is described of preparing the cervix and thus rendering a uterus more amenable to coordinate labour when the cervix is considered unfavourable.

ACKNOWLEDGEMENTS.

In treating patients suffering from preeclamptic toxæmia team work between all members of the staff is essential for any success, and to the honorary obstetrician members of my team and the resident medical officers and nursing staff of the hospital I express my gratitude for their cooperation.

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A NOTE ON BRONCHIECTASIS.

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BRONCHIECTASIS is often described as a disease under the conventional headings of definition, ætiology, pathogenesis, morbid anatomy and diagnosis. For example, Cecil (1948) defines bronchiectasis as a pathological state of the lungs characterized by dilatation of the bronchi. On the question of ætiology it is stated that bronchiectasis may develop as an obvious sequel to various pulmonary diseases, such as bronchopneumonia, lung abscess, pulmonary tumour and tuberculosis, or it may be found without definite antecedent or predisposing pulmonary disease. In the matter of pathogenesis it is stated that destructive changes in the bronchial wall appear to be the most important factor in the pathogenesis of acquired bronchiectasis. Under the heading of morbid anatomy one reads that the associated parenchymal changes may be either concomitant or secondary and not infrequently overshadow the bronchial pathological changes in degree. The diagnosis, we are told, rests principally on X-ray bronchography with the aid of iodized oil, a method introduced in 1922 by Sicard and Forestier. Similarly, Price (1950) defines bronchiectasis as a condition of permanent dilatation of one or more bronchi. Under the section on symptoms it is stated that X-ray examination before and after the injection of lipiodol or "Neohydriol" serves to define the extent of the disease and the degree of fibrosis.

Such descriptions create the illusion that dilatation of the bronchi is the essential and important feature of the disease and that demonstration of dilated bronchi diagnoses the entity and defines its extent. Little emphasis is placed upon the infective element.

Marshall and Perry (1952) adopt similar views with slight differences. In discussing the historical aspects of bronchiectasis they state that "the current theory is that the shrinkage of the lung occurs largely as an acute process following peripheral bronchial obstruction and atelectasis". They continue: "In 1922, however, Sicard and Forestier introduced the use of opaque oil in radiography for the study of hollow viscera of the body, thus enabling bronchiectasis to be diagnosed with certainty in life." They do add a little further on, however, that symptoms depend not on the presence of dilated bronchi, but on infection being superadded to bronchi which are already dilated.

There can be no doubt that it is the infective element which is significant as far as the patient's disability is concerned. The group of specimens to be described emphasizes the importance of infection and minimizes the impor-

tance of bronchial dilatation and shows that infective changes can be present without bronchial dilatation.

In contrast to Cecil's definition stated above, common colloquial usage has given the word bronchiectasis a clinical meaning in which the features of infection are prominent. This clinical entity may be typified by the case of the adolescent with chronic cough of years' duration, who usually expectorates a large quantity of purulent sputum. Recurrent bouts of pyrexia accompanied by chest signs may also occur over a number of years. The subject is retarded in development and often ill. Surely it is for the relief of such symptoms that surgery is undertaken, not primarily for the purpose of removing dilated bronchi, although of course dilated bronchi may have been demonstrated by bronchography. In this clinical entity there is no definite antecedent or predisposing pulmonary disease, such as foreign body, tuberculous glands of the hilus and stricture or carcinoma. The present article is concerned only with cases without any such predisposing condition.

TABLE I.

Specimens Obtained by Thoracic Surgery (Neoplastic Lesions Excepted) from Consecutive Operations between December, 1951, and August, 1953.

Group.	Findings.	Number of Cases.
A	Tuberculosis	2
B	Congenital lesions	2
C	Old abscess	1
D	"Clinical bronchiectasis"	15
	Total	20

Table I lists the material obtained by thoracic surgery during the period from December, 1951, to August, 1953, and submitted to the pathology department of this hospital for examination. Specimens containing neoplasms are omitted, but otherwise the material is derived from consecutive operations. There are 15 cases in category D for consideration. In general, the pathological features of this group were as follows. In some of the cases evidence of pleural adhesions was noted, and in others the lungs, on palpation, were nodular or diffusely firm. Frequently, enlarged hilar glands were seen, individual glands measuring as much as 2·5 centimetres in length. When the bronchi of the unfixed specimens were opened, the normal taper from the main stem bronchus to the periphery was found to be preserved in some instances, providing a great contrast with dilated bronchi. It was considered that normal bronchi within the specimens formed an intrinsic standard of comparison, although perhaps the calibres observed may not have been those actually existing in life. Sometimes the bronchial mucosa had lost its normal translucency, and at times it exhibited fine white lines in a reticulating pattern. Areas were also noted in which the lung parenchyma was white and seemed airless. Viewed histologically, a striking feature was the excellent preservation of the bronchial epithelium, although occasionally squamous metaplasia or even less frequently desquamation was seen. On occasions the walls of the bronchi were œdematous or contained diffuse infiltrates of wandering cells, and at times there were lymphoid masses in the bronchial walls. In some sections fibrous tissue seemed to replace the normal architectural elements of the bronchial wall. In the lung parenchyma œdema or fibrosis of the alveolar walls was often noted, with perhaps diffuse infiltrates of wandering inflammatory cells and metaplasia of the alveolar cells themselves. A common feature in the alveolar walls was the presence of lymphoid masses. Atelectasis was not conspicuous, and recognition of emphysema was uncertain. Sometimes sudanophilic material was found in the alveoli, presumably retained iodized oil. Sometimes pneumonic consolidation with polymorphonuclear cell exudate into the alveoli was noted.

To study more closely the question of dilatation of the bronchi a tabulation has been made in Table II of the

TABLE II.
Correlation of Dilatation of Bronchi with Other Pathological Changes in Bronchi and Lung Parenchyma.

Case Number.	Sex.	Age. (Years.)	Specimen.	Bronchi.	State of Bronchial Lumen.	Histological Changes in Bronchi.	Histological Changes in Related Alveolar Structure.
1	M.	33	Right lower lobe.	All.	Dilated.	Present.	Present.
			Right middle lobe.	All.	Dilated.	Present.	Present.
2	F.	17	Left lower lobe.	All.	Dilated.	Present.	Present.
			Lingula.	All.	Dilated.	Present.	Present.
3	M.	9	Left lower lobe.	Anterior.	Dilated.		
				Middle.	Dilated.	Present.	Present.
				Posterior.	Dilated.		
				Apical.	Not dilated.	Present.	
			Lingula.	Superior.	Not dilated.	Present.	Present.
				Inferior.	Not dilated.	Present.	Present.
4	M.	20	Left lower lobe.	All.	Dilated.	Present.	Present.
			Lingula.	All.	Dilated.	Present.	Present.
5	M.	19	Left lower lobe.	Anterior.	Not dilated		
				Middle.	Dilated.	Present.	Absent.
				Posterior.	Not dilated.	Present.	Absent.
				Apical.	Not dilated.		
			Lingula.	Superior.	Not dilated.	Present.	Present.
				Inferior.	Not dilated.	Present.	Present.
6	F.	10	Left lower lobe and fused lingula.	All.	Dilated.	Present.	Present.
			Accessory lower lobe.	All.	Not dilated.	Present.	Present.
7	F.	9	Left lower lobe.	Anterior.	Not dilated.		
				Middle.	Not dilated.		
				Posterior.	Doubtful.		
				Apical.	Not dilated.		
			Lingula.	Superior } Inferior	Not dilated — doubtful stricture in one unspecified bronchus.	Present.	Present.
8	F.	13	Left lower lobe.	All.	Dilated.	Present.	Present.
			Lingula.	All.	Dilated.	Present.	Present.
9	F.	10	Left lower lobe.	Anterior.	Not dilated.		
				Middle.	Not dilated.	Present.	Present.
				Posterior.	Dilated.		
				Apical.	Not dilated.		
			Lingula.	Superior } Inferior	One unspecified bronchus dilated.	Present.	Present.
10	F.	12	Left lower lobe.	All.	Dilated.	Present.	Present.
			Lingula.	All.	Dilated.		
11	F.	25	Right lower lobe.	Anterior.	Not dilated.	Present.	Present.
				Middle.	Not dilated.	Present.	Present.
				Posterior.	Not dilated.	Present.	Present.
				Apical.	Not dilated.	Present.	Present.
			Right middle lobe.	Medial.	Dilated.	Present.	Present.
				Lateral.	Dilated.	Present.	Present.
12	F.	17	Left lower lobe.	All.	Dilated.	Present.	Present.
			Lingula.	All.	Dilated.	Present.	Present.
13	F.	17	Right lower lobe.	All.	Dilated.	Present.	Present.
			Right middle lobe.	All.	Dilated.	Present.	Present.
14	M.	16	Right lower lobe.	Anterior.	Not dilated.	Present.	Present.
				Middle.	Dilated.	Present.	Present.
				Posterior.	Not dilated.	Present.	Present.
				Apical.	Not dilated.	Present.	Present.
15	F.	21	Left lower lobe.	All.	Dilated.	Present.	Present.
			Lingula.	All.	Dilated.	Present.	Present.

state of the bronchi with regard to their calibre in relation to other pathological changes in the corresponding areas of the lung. Where records are deficient, blanks are left in the table. The table shows the important fact that bronchial dilatation does not correspond in its distribution with evidence of inflammatory change either in the bronchi or in the lung parenchyma. Seven of the 15 cases, namely, numbers 3, 5, 6, 7, 9, 11 and 14, show this clearly. If one or other diseased lobe is not removed at lobectomy, simply because none of its bronchi is demonstrably dilated on bronchography, it is easy to understand that the patient's symptoms will not be cured. Numbers 3, 5, 7 and 11 are instances in which all the bronchi throughout a diseased lobe are of normal calibre. In view of the long-standing nature of the disease in the cases under discussion, this finding cannot be satisfactorily explained by postulating a reversal of the disease process.

Any difficulties that may exist in the matter of assessing bronchial dilatation by inspection of bronchograms do not come within the scope of the present discussion.

Summary.

The morbid anatomical state forming the basis of the clinical entity bronchiectasis is not simply bronchiectasis in the literal sense of dilated tubes. This morbid anatomical state is of the nature of non-specific chronic or recurrent pneumonitis. Dilated bronchi may or may not be found in the diseased areas; hence the presence or absence of bronchial dilatation as demonstrated by bronchography cannot be relied upon to define the extent of the disease.

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Reviews.

A Handbook on Diseases of Children: Including Dietetics and the Common Fevers. By Bruce Williamson, M.D. (Edinburgh), F.R.C.P. (London); Seventh Edition; 1953. Edinburgh and London: E. and S. Livingstone, Limited. 7½" × 5", pp. 478, with 102 illustrations, a few in colour. Price: 21s.

THIS attractive book has reached its seventh edition in twenty years. It must by now be well known as an extremely useful *vade mecum* for students and general practitioners.

As on previous occasions, the author has provided in the introduction vital statistics culled from the report of the Registrar-General for England and Wales. The infant

mortality rate has fallen from 41 in 1947 to 30 in 1950. Respiratory and alimentary diseases remain the most important causes of death of infants and little children, but the vulnerability has been countered impressively by isolation, nursing technique, restoration of electrolytes, antibiotics and mothercraft training. Children in attendance at school accounted in 1950 for 10% of the total motor accident fatalities. In the Borough of Islington, London, not a single death in childhood occurred on the roads in 1952. This example is quoted to illustrate the efficacy of improved traffic control, propaganda, school instruction and driving efficiency.

As one would expect, further information is supplied in this edition about the pædiatric uses of the antibiotic remedies. A comprehensive table is provided as a summary of the indications for the use of penicillin, streptomycin, chloramphenicol, aureomycin and terramycin. Most practitioners prefer to avoid injections in the treatment of children. Aureomycin is potent only in acid solution and is therefore given by mouth. Pædiatric "Chloromycetin Palmitate" is palatable and is effective when given orally in its field of action; a commendable dosage chart has been devised. Brief reference is made to advances in knowledge of the place in therapeutics of the adrenal cortex hormones and the pituitary adrenocorticotrophic hormone. In general it seems to be advisable to wait for further information of the role of these substances in normal physiology. Some favourable reports are recorded in specified conditions, but harmful and dangerous contraindications are warnings of the need for caution and conservatism.

The little book is beautifully made and well illustrated. The contents are concise and well arranged. It may well be the best available handbook on the subject.

The Thyroid: A Physiological, Pathological, Clinical and Surgical Study. By T. Levitt, M.A., F.R.C.S. (Eng.), F.R.C.S. (Ed.), F.R.C.S.I.; 1954. Edinburgh and London: E. and S. Livingstone, Limited. 10" × 7¼", pp. 630, with many illustrations, some in colour. Price: £5 5s., postage abroad 2s. 5d.

IN this book T. Levitt presents a physiological, pathological, clinical and surgical study of the thyroid with its many problems of normal and abnormal states. The theme of the book is expressed in the first paragraph of the preface "to accept meekly and to repeat slavishly the time-honoured beliefs of the past, without reassessment, spells retrogression". For twenty-five years the author collected a multiplicity of data from all available sources and has integrated them in an original concept based mainly on the histological appearances found in some 2100 consecutive thyroidectomies. This has necessitated the coining of new words, the presentation of new theories and a fresh correlation of clinical and pathological data. Whether this reassessment has achieved the author's objective and means progress is a matter of opinion, especially so as it is necessary for its understanding that the reader should have a full knowledge of thyroid disease. The book is by no means one from which the beginner may learn the subject. In fact the author states that comparatively little space is given to those problems of thyroid disease on which general agreement has been reached, and practically no mention is made of preventive measures or treatment in early stages.

By coincidence the 2114 glands studied fell into three equal groups: (a) epithelial hyperplasia, 706; (b) lymphofibrosis, 704, in which lymphoid and fibrous tissue formation is added to a basic epithelial hyperplasia; and (c) miscellaneous, 704, consisting mainly of diffuse and nodular colloid goitres, 32 malignant growths, nine cysts and two cases of tuberculous disease. Mention is made of goitres induced by thiouracil, thiocyanate, PAS and resorcin, all of which may induce a frustration hyperplasia. The acinus as the functioning unit of the thyroid undergoes the three basic processes of proliferation, secretion and rest which may all be manifested in the same gland in varying stages. Use of the electron microscope shows that in spite of apparent discrepancy of acinar form and function each phase of the degenerating gland conforms to a common pattern. These phases of hyperplasia Levitt classifies as (i) epithelial, (ii) lympho-epithelial, (iii) focal lymphoid, (iv) diffuse lymphoid, (v) fibro-lymphoid, and as a final degenerating condition (vi) fibrosis. This constitutes his main theme all through the book.

An attempt has ben made to correlate symptoms and signs with each of these stages and one has to use some imagination in trying to identify each of the phases. The author apparently realizes this, as in attempting to assess "mild toxicity" he states that all the intuitive ingenuity of the observer is required to elicit evidence of any mildly toxic phase in the previous history, and he even calls on the patient's relatives for information, even though the patient has not sought previous medical advice. No help is given in determining whether symptoms are those of an anxiety state alone, whether such a condition may be combined with a thyrotoxic state or what part the climacteric may play other than to say that thyrotoxicosis is often associated with that period of endocrine disturbance.

Levitt postulates two thyrotropic hormones—one "proliferin", the centre for which is in the hypothalamus, and the other "secretin" produced by the pituitary. Also he refers to "exophthalmin" as an activator of collagen and responsible for œdematous swelling and lymphoid deposition in all collagen tissues of the body including the orbital cavity. Treatment of exophthalmos and the solid œdema of the legs is not helpful and follows conventional lines, but is well summarized, and he presents a really magnificent series of photographs of both these conditions.

In discussing "thyroid crisis" Levitt lists 12 cases, most of which occurred before the introduction of thiouracil. Six occurred prior to operation with one death, and six after operation with four deaths. No mention is made of the role of the liver in the ætiology of this condition and of the necessity for estimation of its detoxicating function by Quick's hippuric acid excretion test, especially in cases of chronic low-grade thyrotoxicosis and in elderly people with nodular goitres. Reference is made to the use of thiouracil in thyrotoxicosis associated with pregnancy, but he does not stress the importance of minimal dosage in the final trimester or of discontinuing this drug altogether and giving small doses of iodine to compensate for the normal hyperthyroid activity at this stage. Malignant disease of the thyroid is only summarized as the author intends dealing fully with this condition in a separate publication.

Considerable space is given to the technique of thyroidectomy, which varies in certain details from that usually followed, and illustrations are given of rare ectopic sites of parathyroid glands on the anterior and lateral aspects of the thyroid and one attached to a pyramidal lobe, all of which would be difficult to explain embryologically. The rationale and scope of radio-iodine is discussed, but no details are given as to its administration. Treatment of toxic thyroid conditions with the thiouracils is very sketchy and of no value. Translations of the original papers by Riedel and Hashimoto are appended and are not without interest. A very complete index is given of the subject material and also an index of authors quoted.

There are 502 figures, many full page, including photographs and photomicrographs, many in colour, and several made with the electron microscope with a magnification of 12,000 diameters. There are 43 tables summarizing or illustrating various features, many of which would be useful for teaching purposes. The proof-reading has been very good as only three minor errors were noticed. The publishers are to be congratulated on the excellence of paper, print, the colour and microscopic reproductions and the binding, which allows the book to stay open as required by the reader despite its 606 pages. This is truly an example of the supreme art of the publisher.

Surgical Pathology. By Lauren V. Ackerman, M.D.; 1953. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical), Limited. 10" × 7", pp. 386, with 913 illustrations. Price: £7 12. 3d.

THIS volume contains a description, with illustrations, of the conditions met by the surgeon. It covers a large field and, as the author states, "can be only an introduction to the vast field of surgical pathology".

It follows that the various subjects can be dealt with only briefly and in many cases this is no more than just a passing reference. In some cases the small amount of information raises the question of whether it would not have been better omitted. Hence the author's statement that "this book has been written for the medical student as well as for physicians" seems to be of doubtful justification.

More attention is given to the spleen and to the female reproductive system than is usual, and there is a chapter on diseases of the skin. This contains references to most conditions likely to be encountered. Although many of them, as in the rest of the book, are beautifully illustrated, there is insufficient information to assist any but the experienced individual. The chapter on the central nervous system is dealt with well in view of the limited space.

The general problem of presentation is indicated by the chapter on vascular diseases (an important section in surgical pathology) since, of the eight effective pages, five are taken up by magnificent, but possibly unnecessarily large, illustrations.

This book is doubtless of considerable value in the school where it originated, but too many statements are dogmatic, and some, probably because of the enforced brevity, erroneous. Statements regarding biopsy, grading of tumours and the like are also far too brief to be of any value. On the other hand it is clear that much work has been put into the preparation of this volume. The illustrations have been well chosen and are magnificent. Because of these, some will make sure to have this book on their shelves, but in these days of increasing difficulty of accommodating books it would be well to weigh the pros and cons (and the book!) before allowing it to oust some other volume. For those who wish to add to their various atlases this volume can be strongly recommended.

Pediatrics in General Practice. By James G. Hughes, B.A., M.D.; First Edition; 1952. New York: McGraw-Hill Book Company, Incorporated. 10″ × 7½″, pp. 748, with 178 illustrations. Price: $14.00.

THIS is a magnificent new book written especially to provide general practitioners with a reliable guide to the recognition and treatment of disorders and diseases likely to be encountered in children.

Examination of the book serves to confirm the opinion that Professor Hughes is not only a superlatively trained teacher of his subject and a very capable person, but that he has an intimate way of expressing himself so that the reader feels that the author is available in person for consultation. After receiving training from Dr. Joseph Brennemann in Chicago, Professor Hughes was engaged for two years on a full-time basis in post-graduate teaching embracing daily discussions and consultations and lectures over an extensive network of teaching centres. Then following upon five years spent as associate professor he received in 1952 his appointment as a full professor of pædiatrics and retained his clinical posts at two hospitals for children.

The book is large and expensive, but it is beautifully printed and illustrated and it is a great improvement on the usual run of handbooks, which have room for only scrappy paragraphs on a wide variety of topics. It is more than a book of reference, for it is genuinely educative with a systematic approach from the normal to the abnormal and with explanations and reasons advanced by a master teacher who has a philosophical and disciplined mind; therein lies the secret of the feeling that the teacher is at the elbow of the reader. Only occasionally does one dip into the book and fail to find what is wanted; it has been adjudged outside the scope of general practice. In this country we would expect an exposition of pink disease, but reference to that syndrome is lacking. We cannot find anything about Hirschsprung's megacolon and we are not satisfied that the account of cœliac (celiac) disease is up to date. Yet so many matters of minor importance are described masterfully that no practising pædiatrician can afford to be ignorant of the contents of the book, especially if copies of it are purchased and used by most general practitioners.

It is highly to be desired that the standard of practice in the service of children should be raised as much as possible, and wherever the English language is used Professor Hughes cannot be blamed if this laudable objective falls short of his intentions. His difficulty will be to supply supplementary editions to maintain the freshness and lasting authoritativeness of his text; it seems likely that he will have to engage the support of sectional collaborators.

A Handbook of Operative Surgery: Surgery of the Biliary Tract, Pancreas and Spleen. By Charles B. Puestow, M.D., Ph.D. (Surg.); 1953. Chicago: The Year Book Publishers, Incorporated. 8½″ × 6″, pp. 370, with 72 illustrations. Price: $9.00.

THIS volume is one of the "Handbooks of Operative Surgery", and is designed to offer to the adequately trained and competent surgeon a source of information for procedures with which he is unfamiliar, or has had minimal experience. It is designed also to serve as a guide to residents receiving training in surgery. It is clearly stated that the book is not for the untrained and inexperienced physician who may wish to attempt surgical procedures for which he is, as yet, not adequately prepared. This work has been prepared by a surgeon who has accepted it as his responsibility to disseminate his knowledge, skill and judgement to his fellow surgeons, and the wide experience of the author is abundantly clear.

To evaluate this book, the plan to which it was prepared must be borne in mind, and on that basis it will be conceded that this is a useful and acceptable book. Some of the operative procedures vary from current practice in these

parts, and in particular the section on hydatid disease of the liver is not up to the standard of the book as a whole. No differentiation between endocyst and ectocyst is made, nor is there any reference to the problems associated with the calcified lesion. In performing a biliary anastomosis, many surgeons would prefer a cholecyst-duodenostomy to a cholecyst-gastrostomy, and patients appear to tolerate this form of anastomosis better. However, taken as a whole and remembering its object, the book deserves commendation.

Notes on Books, Current Journals and New Appliances.

World Distribution of Rickettsial Diseases. I. Louse-borne and Flea-borne Typhus; 1953. New York: American Geographical Society. Map, 3′ × 2′, with selected bibliography. Price: $1.25.

THIS map is the first of a series being prepared by the Department of Medical Geography of the American Geographical Society, showing in general the distribution of rickettsial diseases throughout the world, and in this particular instance the distribution of louse-borne and flea-borne typhus. It consists primarily of a map of the world coloured to show the areas in which these diseases have been reported. Small inset maps show the areas in which louse-borne typhus occurred during the first and second world wars and their aftermath. The epidemiology of these two forms of typhus is explained in a short appendix. Tables show the approximate number of cases of louse-borne typhus in selected countries in times of stress (the two world wars and others) and the approximate incidence (reported yearly) of louse-borne and flea-borne typhus in selected countries in times of non-stress. In addition to a list of basic sources of information, a selected bibliography by countries is supplied.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Methods of Examination in Ear, Nose and Throat", by W. G. Scott-Brown, C.V.O., M.D., B.Ch., F.R.C.S.; 1954. London: Butterworth and Company (Publishers) Limited; Sydney: Butterworth and Company (Australia) Limited. 8½″ × 6″, pp. 118, with 94 illustrations. Price: 28s.

Intended primarily for the general practitioner.

"Emergency Surgery", edited by Bernard J. Ficarra, A.B., Sc.B., M.D.; 1953. Philadelphia: F. A. Davis Company; Sydney: Angus and Robertson Limited. 10½″ × 7″, pp. 1026, with 578 illustrations. Price: £9 13s. 6d.

The work of 79 contributors.

"Mother and Baby Care in Pictures", by Louise Zabriskie, R.N.; Fourth Edition; 1953. Philadelphia: J. B. Lippincott Company; Sydney: Angus and Robertson Limited. 9½″ × 6½″, pp. 256, with 255 illustrations. Price: 32s. 3d.

Written primarily for parents.

"Hypertensive Diseases: Causes and Control", by Henry A. Schroeder, M.D., F.A.C.P., with contributions from Gregory S. Gressel, M.D., Dean F. Davies, Ph.D., M.D., H. Mitchell Perry, junior, M.D., and Donald F. Gibbs, M.B., Ch.B., M.R.C.P. (Edinburgh); 1953. Philadelphia: Lea and Febiger; Sydney: Angus and Robertson Limited. 9½″ × 6½″, pp. 610, with 167 illustrations, three in colour. Price: £5 7s. 6d.

This book "is a chronicle of a long-term study of arterial hypertension, culminating in the development of specific therapy".

"Experimental Diabetes and its Relation to the Clinical Disease: A Symposium Organized by The Council for International Organizations of Medical Sciences"; consulting editors, J. F. Hoet and F. G. Young; editors for the Council, J. F. Delafresnaye and G. Howard Smith; 1954. Oxford: Blackwell Scientific Publications. 9″ × 6″, pp. 362, with 54 illustrations, four in colour. Price: 35s.

The Council for International Organizations of Medical Sciences was established under the joint auspices of U.N.E.S.C.O. and W.H.O.

The Medical Journal of Australia

SATURDAY, JUNE 12, 1954.

WHAT SHOULD THE CANCER PATIENT BE TOLD?

WHETHER we like it or not, a great deal of information is available to the general public today on cancer of various types, its signs and symptoms and its general prognosis. This comes not only from popular medical writing, but from deliberate campaigns to educate the public in the interests of earlier diagnosis and therefore earlier treatment of a condition in which early treatment is undoubtedly of vital importance. Hence a different light is thrown on the old question of whether a patient who is found to be suffering from cancer should be told of the diagnosis. Those who consider that the patient should not be told have to contend with the fact that the patient knows a certain amount, and in many cases has sought medical advice because what he knows has made him suspicious; to suppress the diagnosis in such a case is not a simple matter. Undoubtedly, just how much a patient can be told will depend on the patient and his likely reaction to the news, and the individual medical adviser has to make up his own mind on the matter. It would be neither sensible nor fair to lay down the law for him in generalities about the action that he should take. However, the problem is one on which many medical practitioners would be glad of guidance, and so it may be of some help and interest to refer to an investigation carried out in Philadelphia by W. T. Fitts, junior, and I. S. Ravdin[1] into the opinions and practice of doctors in Philadelphia County. A sample of 444 physicians was questioned about the information given to patients suffering from cancer. For simplicity, each was asked to state which of the four following practices he followed: (i) I always tell the patient he has cancer. (ii) I never tell the patient he has cancer. (iii) I usually tell the

[1] *J.A.M.A.*, November 7, 1953.

patient he has cancer, but do not under certain circumstances. (iv) I usually do not tell the patient he has cancer, but do tell under certain circumstances. The response to the *questionnaire* was excellent and indicated a keen interest in the problem. Of the 444 physicians, 89% responded and 82% gave answers complete enough to be tabulated. For broad analysis, the answers were grouped into two sections: 70% of the physicians stated that they either never told a patient he had cancer or usually did not tell; 30% either always told or usually told the patient. The grouping according to the four basic attitudes was as follows: 3% stated that they always told the patient, 28% usually told the patient, 57% usually did not tell the patient, and 12% never told the patient. When the practitioners questioned were grouped according to their type of practice, it was found that the proportion of those who always told the patient or usually told the patient was highest amongst those practising dermatology and syphilology; for them the figure was 94%. For those practising psychiatry and neurology it was 60%, for surgeons 41%, for general practitioners 30%, and so on down to radiologists 12%. The attitude of the dermatologists is, of course, not difficult to understand, as, in general, skin cancer has an unusually favourable prognosis. Some light is thrown on the attitude of the psychiatry and neurology group by the remark made by some of the psychiatrists that they did not see many cancer patients and their answers represented what they thought should be done. At the other end of the list, making up those who never told or usually did not tell the patient, were those practising internal medicine, obstetrics and gynæcology and radiology. It is suggested that their attitude may be explained, partly at least, by the fact that they tend to see the patient in the later stages of the disease, or are responsible for terminal care.

Those questioned were also asked to list reasons that might cause them to disregard their usual practice of telling or not telling. The most frequent reason given for not telling the patient when the usual practice was to tell was the danger of an unfavourable emotional reaction. The next most frequent reason was a request of the patient's family. When the usual practice was not to tell, the commonest reason for telling the patient was his refusal of necessary treatment. The second was the special need of some patients to plan for the future. Fitts and Ravdin record in some detail the comments made by many of the doctors questioned. Although it is not practicable to reproduce these here, they are well worth reading by those who are interested in the question. A frequent comment was that although the patient himself is not told, a responsible member of the family should always be told. It is interesting to note the strong statements made by individual doctors that are, on the surface, mutually contradictory. Some were of the opinion that all patients were adversely affected by being told that they had cancer and that no good could come of telling them. Others with considerable experience stated exactly the opposite. The obvious inference from this is that some doctors are much better able to handle their patients than others, and a great deal must depend on the confidence that the patient has in his doctor. This factor is recognized by members of both main groups. One doctor made the remark: "The way some physicians handle patients and relatives in the

presence of cancer suggests that as doctors they are good blacksmiths." Just what this particular doctor thought of the profession as a whole is, however, a matter of speculation, because he belonged to the group that affirmed that a patient should not be told he has cancer. Fitts and Ravdin make the comment that the study shows that a great deal more needs to be done in determining the mental and emotional reactions of cancer patients, and how these reactions should be handled by the doctor. This is true enough, but the situation is a present and practical one that medical advisers are faced with every day. It is clear that responsibility is not evaded by a merely negative attitude. Not telling the patient, whether from deliberate policy or from inanition, is just as much a significant course of action as telling him, and it may well be that the implications are greater. An immediate blunt revelation of the facts is perhaps never justified, although there may be exceptions. A gentle, understanding intimation of the facts, given perhaps over a period of time, is another matter. Most patients are going to find out sooner or later in any case, and the aim of doctor and relatives might well be to see that this knowledge comes in the kindest way. Evasion of responsibility in this may paradoxically involve acceptance of the graver responsibility.

Current Comment.

PROBLEMS OF BROAD SPECTRUM ANTIBIOTIC THERAPY.

MOST effective therapeutic agents have undesirable effects in certain circumstances, and it would have been too much to hope that the powerful antibiotics would be free of this disadvantage. The so-called side effects of the antibiotics have, in fact, been coming to light for some time now, and it is as well that they should have publicity, not in order to discredit the drugs themselves, but to ensure their right and most effective use. Recently, some of the problems associated with penicillin therapy were discussed in these columns. Now it is necessary to turn our attention to the broad spectrum antibiotics, whose efficacy against a wide range of organisms results in both advantages and disadvantages. Two of the best known of this group are chlortetracycline and oxytetracycline (better known under their respective trade names of "Aureomycin" and "Terramycin"), which have an almost identical spectrum of activity. Both these antibiotics are now, in the words of M. Finland, M. E. Grigsby and T. H. Haight,[1] undisputedly ranked among the most important antimicrobial agents that are available. However, because of the fairly frequent occurrence of diarrhœa, mainly of a staphylococcal nature, in patients being treated with oxytetracycline and an impression that smaller individual doses of the drug produced less frequent and less severe untoward gastrointestinal effects, Finland, Grigsby and Haight analysed the effect of oxytetracycline and chlortetracycline in a series of 520 patients being treated for a large variety of diseases. They were particularly concerned to find out whether a reduction in the size of the individual doses and of the total daily dose below those previously employed would reduce the frequency and severity of the toxic effects from these two antibiotics without significantly impairing their therapeutic efficacy. Most of the patients were given oral doses of 250 milligrammes every four hours or every six hours, but 37 of them received doses of 500 milligrammes at similar intervals. Favourable clinical and bacteriological results were obtained from each of the dosage schemes in patients with acute infections due to susceptible types of organisms, and the results with each

of the antibiotics were, on the whole, fairly comparable. The most frequent toxic effects observed were those involving the gastro-intestinal tract. The frequency of occurrence of gastro-intestinal complications, and particularly of severe watery diarrhœa, was significantly greater among the patients who were treated with oxytetracycline than among those who received chlortetracycline in the same dosage. With each of these antibiotics, diarrhœa was about twice as frequent among patients who received 250 milligramme doses every four hours or 500 milligramme doses every four hours or six hours than among those given 250 milligramme amounts every six hours. Cultures were prepared from the fæces of 38 patients who developed diarrhœa during oxytetracycline therapy and of 20 who had diarrhœa during treatment with chlortetracycline. In 27 of the first group and four of the second group, hæmolytic coagulase-positive strains of Staphylococcus aureus were found as the only or predominant organism in the cultures. Particularly noteworthy was the fairly rapid manner in which diarrhœa subsided and the normal flora returned in the stools in most cases when the oral administration of the offending antibiotic was discontinued and only general supportive measures were instituted promptly after the diarrhœa began. This improvement occurred without relation to the subsequent use of other specific antibacterial agents or to the susceptibility of the fæcal staphylococci to those agents. Another important point noted was the association of the use of cathartics with the beginning of severe diarrhœa, including that associated with the presence of staphylococci.

The general conclusion reached from the analysis was that the untoward gastro-intestinal manifestations of the effect of these antibiotics, particularly the severe watery diarrhœas, may be materially reduced by lowering the dosage of the drugs. They may also be prevented in part by avoiding catharsis, and their severity and duration may be reduced by stopping oral administration of the antibiotics and promptly instituting the proper supportive measures as soon as watery diarrhœa begins. Finland, Grigsby and Haight state that the possibility that some therapeutic efficacy may have been sacrificed because of the use of the lower dosage cannot be excluded, but grossly the clinical and bacteriological effects appeared to be adequate in most cases. However, they suggest that until this aspect is clarified it would be safer to use the smaller oral doses and to supplement them with intravenous doses of 500 milligramme amounts once or not more than twice daily in serious cases, or when the small oral doses might be considered inadequate for any given infection.

Another important analysis of the effects of oxytetracycline is that carried out in Glasgow by Peter Hay and Peter McKenzie,[1] the data being their observations during the treatment of 603 patients. A considerable proportion of their patients were small children suffering from gastrointestinal infections, and they excluded from their consideration the common manifestations of oxytetracycline toxicity such as nausea, vomiting, diarrhœa and headache. It was noted that in the series of 603 patients, side effects other than mild gastro-intestinal upsets developed in 51 patients on 52 occasions; this represents an incidence of about 8%. As exceptions to the rule of excluding gastrointestinal effects, two cases of fulminating gastro-enterocolitis were included; in each case the child died. In 15 cases sore throat developed, either with a rash (the so-called staphylococcal scarlet fever syndrome) or without a rash. One patient developed a rash without a throat lesion ("surgical" or extrafaucial staphylococcal scarlet fever syndrome), and three patients developed urinary infections due to a coagulase-positive Staphylococcus aureus resistant to oxytetracycline. This first group of 21 manifestations of oxytetracycline side effects were all associated with the presence of coagulase-positive Staphylococcus aureus. In the remaining 31 cases, coagulase-positive Staphylococcus aureus was not isolated. In this group, the manifestations noted were pyrexia alone in 24 cases, urticaria in three and transient erythema in four. Hay and McKenzie discuss these various manifestations in turn and make some tentative suggestions about the

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[1] Arch. Int. Med., January, 1954.

[1] Lancet, May 8, 1954.

pathogenesis, but just how antibiotics upset what they refer to as the "complex host-parasite-drug relationship" is still obscure. The subject is of great interest and importance and warrants further thorough inquiry. Meantime, no one will quarrel with the concluding pronouncement of these investigators that broad spectrum antibiotics should not be used in the treatment of minor illnesses. At the same time it is necessary to preserve a balanced outlook towards antibiotic therapy. Finland, Grigsby and Haight point out that many doctors, as a result of their experiences with the toxic manifestations of the antibiotics, have learnt their lesson, the result being a reduction in the number of patients who receive such therapy unnecessarily and who may suffer serious consequences from this superfluous treatment. On the other hand, they continue, some physicians have become over-cautious, and as a result may have deprived some of their patients suffering from serious infections of the benefits of useful and highly effective antibiotics which, when properly employed, are known to be life-saving and capable of appreciably reducing the duration of acute infections and their sequelæ. This, of course, is unfortunate and undesirable.

RATIONS IN THE MOUNT EVEREST EXPEDITION OF 1953.

ONE of the difficulties facing climbing parties in the Himalayas in the past has been the supplying of sufficient and adequate food for the members of the parties. Himalayan expeditions usually lived off the country, supplementing local food from bulk stores. The 1953 party had composite rations, thus providing a more variable and palatable diet than is possible for a party living mainly off the country. The sudden change to a strange and bulky diet at the beginning of the expedition was avoided by the use of composite rations. L. G. C. Pugh[1] has given a detailed account of the food taken on the expedition, the way it was packed so as to give good variety from day to day, and the different requirements at different heights. Composite rations of the type used by the armed forces for supplying troops operating in isolated groups or small units were developed. The advantages of such rations are provision of a European type of diet, increase in palatability and variety, simplification in sorting and making up loads, avoidance of shortages of essential items due to pilfering or over-consumption, and reduced contamination of food by flies and in handling. The disadvantages were increase in weight and expense, but porters were easy to obtain. There were two types of ration: a "composite" ration for general use and an "assault" ration for use above 21,000 feet. The general purpose ration was packed in weatherproof fibre-board boxes of gross weight 45 pounds, containing an evening meal, breakfast and food for the day's climbing for fourteen men for one day. All the items were packed in tins. There were five varieties of meat as well as salmon, four varieties of vegetables, tinned fruit, cake, oatmeal biscuits, butter, jam, marmalade, chocolate and other items necessary for the consumption of the food, cleaning et cetera. The different boxes had different combinations so that a different menu could be served on each day of the week. In addition, there were boxes with biscuits and with beverages. Cooking was done in pressure pans on very efficient "Primus" stoves. The calorie value of each ration was about 4800 Calories per man per day. Locally purchased food was sometimes used as a supplement. The assault rations had to be of reduced weight and consisted of basic foods only, all vacuum packed; so-called luxuries chosen by the climbers were also taken. The packs contained rations for two men for one day in each and there was no meat unless this was chosen as a luxury item. A demand for sugar at great heights has long been recognized, but the requirement is so large that the supply has seldom been sufficient. Even men who are not fond of sugar and sweets at sea level find that their

[1] Proc. Nutrition Soc., 1954, Volume 13, Number 1.

sugar intake increases as they go higher. Seven ounces of sugar were supplied in the assault pack and the rest of the ration was largely carbohydrate. There is a physiological reason for this demand. It has been pointed out that at 20,000 feet the effect on the mean capillary oxygen pressure of a rise of respiratory quotient from 0·8 on a mixed diet to 1·0 on pure carbohydrate would be equivalent in oxygen requirements to a reduction in altitude of 2000 feet. Hillary has described how he and Tensing spent much of the night in camp at 27,900 feet in brewing tea. They added three or four heaped dessertspoons of sugar to each mug of tea as well as milk. For food they ate sardines and biscuits. On getting back to Camp 4, the day after the ascent to the summit, Hillary ate two omelettes and six ounces of salmon at a sitting and drank two pints of lemonade. The members of the party were given compound vitamin pills, but except for ascorbic acid, the rations were adequate in vitamins. The general physical condition of the members of the 1953 expedition was considered to be better than on the 1952 expedition, and the loss of body weight, which is characteristic of a sojourn at high altitudes, was less than on previous expeditions.

PATHOLOGICAL CHANGES IN THE INNER EAR FOLLOWING MATERNAL RUBELLA.

FOLLOWING the observation of congenital deafness as one of the serious sequelæ of rubella infection of the mother in the early months of pregnancy, D. G. Carruthers,[1] of Sydney, published in 1945 the first report of microscopic studies made upon serial sections of the ears of one of these afflicted infants. This represented a step forward in the study of congenital deaf-mutism, for in the years that had passed no such epidemic had been recorded before, and in most other instances children who reach an age at which deaf-mutism can be definitely recognized do not perish of the disease which has caused it. Maternal rubella has also caused other congenital defects, sometimes incompatible with life, or in some instances the children affected perished early of intercurrent infections. This condition following maternal rubella, and some cases of kernicterus from Rh incompatibility, which also often produces a form of congenital deafness, have furnished a long-sought opportunity to study the effects upon the auditory mechanism. In his first report Carruthers found that the middle ear and bony labyrinthine structure appeared macroscopically to be normal. Microscopic study of serial sections prepared at the Kanematsu Institute, Sydney Hospital, revealed inner ear abnormalities to account for the deafness. Differentiation of the primitive cells to form the organ of Corti appeared to be lacking. The stria vascularis contained relatively few blood vessels and seemed shallower and less cellular than usual. The membrana tectoria was of rudimentary form. Reisner's membrane was collapsed and often hard to identify. It was then suggested that the stria vascularis might not have secreted endolymph at all. There have been other reports of microscopic study of these cases since Carruthers's publication. F. R. von Nager,[2] writing from Zurich, reported that his findings and conclusions substantially supported the original. Recently a further report[3] has appeared, in which Professor J. R. Lindsay, of the University of Chicago, with D. G. Carruthers, of Sydney, W. G. Heminway, of Chicago, and S. Harrison, of London, has considered the findings in a further series of nine temporal bones, five of which were supplied by Carruthers from Australia. While there has been some difficulty at times in assessing post-mortem effects, the pathological changes originally described by Carruthers were observed in a number of sections. The conclusions arrived at are as follows: (a) The virus reaches the developing sensory structures by way of the blood vessels and the endolymph. (b) The stria vascularis is the most vascular area in the

[1] M. J. AUSTRALIA, March 31, 1945.
[2] Pract. Oto-rhino-laryng., 14: 25, 1952.
[3] Ann. Otol., Rhinol. & Laryngol., December, 1953.

membranous part of the inner ear, and therefore the endolymph of the cochlea and saccule may be subjected to a larger concentration of virus irritant; this explains a predilection for damage to the cochlea and saccule. (c) The reduction in the extent of the *stria vascularis* has been interpreted as an indication of the direct effect of the rubella virus, which in turn permitted a greater concentration of the virus irritant in the endolymph with resultant injury to the developing structures within the cochlear duct and saccule. (d) Malformations of the tectorial membrane and Corti's organ provide an explanation for the absence of auditory function.

ADRENALECTOMY AND CANCER OF THE BREAST.

EARLIER this year[1] we published a report by Kathleen Cuningham, of Sydney, of her experience in the treatment by adrenalectomy of a patient who was suffering from extensive metastases from carcinoma of the breast. Judged on a short-term basis, the result was pleasing and, although not significant by itself, was in line with the results obtained by Huggins and others in the United States from the same type of treatment. The work of Huggins in this field is probably the best known, and in the same issue as that in which Dr. Cuningham's report was published, we reviewed in these columns a paper by Huggins and Dao based on their treatment of 55 patients, two men and 53 women, who were suffering from mammary cancer and were treated by adrenalectomy. Their results were, to say the least, encouraging. In line with their experience is that of L. N. Pyrah and F. G. Smiddy,[2] of Leeds, who between April and December, 1953, carried out bilateral adrenalectomy and bilateral oophorectomy on 22 patients suffering from advanced mammary cancer with metastases. They report that, of these 22 patients, one died soon after the operation, and eight have either died from cancer or shown no improvement. On the other hand, ten have improved and five of these have had a major remission. Again, judged on a short-term basis, these results may be regarded as confirming the work of Huggins and his co-workers. In more general terms, it may be said of Pyrah and Smiddy's series that about half the patients in whom it has been possible to estimate the effects of the operation have improved; in about a quarter of the series there has been a major remission, with great improvement in general health and with demonstrable regression of the primary growth (if it was still present) and its visible metastases, and with pronounced radiographic improvement in relation to osseous and thoracic cancerous deposits. Pyrah and Smiddy state that the dramatic response in four of the patients in the short space of a few weeks to an indirect surgical attack on the origins of the cancer has been remarkable. They do not claim for one moment that the regressions are permanent, admitting frankly that they do not know. Further observation of the patients operated on and extension of the series are necessary before an accurate long-term estimate of the effect of bilateral adrenalectomy can be made.

Pyrah and Smiddy point out that their findings agree further with those of Huggins and his co-workers in that tumours having an alveolar or adenomatous structure have responded most favourably to adrenalectomy. From the experience in this series, however, it appears to be unwise to rely on a single biopsy before a patient is rejected as unsuitable for adrenalectomy. In two cases of the series, biopsy specimens from different parts of the growth were reported as showing spheroidal-celled carcinoma and alveolar carcinoma, and in one case in which there was a favourable response the sole report obtained was that of spheroidal-celled carcinoma. Pyrah and Smiddy's view, therefore, is that in the selection of patients for adrenalectomy, despite the apparent association of an alveolar structure of the growth with a relatively favourable prognosis, if patients are rejected for operation on the evidence of a single biopsy, an occasional case is missed in which

a favourable response may be obtained. A photomicrograph reproduced with this paper shows a high-power section from a skin nodule of spheroidal-celled carcinoma and a section of the remains of a neighbouring nodule which has almost disappeared, leaving only degenerate and partially strangled cells in a stroma of fibrous tissue. Whether these cells can grow it is not possible to say. Pyrah and Smiddy state that the changes noted in the skin nodules in cases in which a response was seen have been those of a slow, gradual shrinkage rather than a massive necrosis with the formation of a slough. On the question of relapse, they point out that it is unknown how far the presence and possibly the hypertrophy of accessory cortical adrenal tissue left untouched when the two adrenals are extirpated is responsible for relapse after a major regression. There is a certain amount of evidence on the subject from the reports of other workers, but at present the problem requires further study before a true opinion on the importance of accessory glands can be formed. Indeed the whole subject requires a much longer period for assessment, a fact which those who are most concerned with it are the first to recognize.

ANTIBIOTICS IN ANIMAL NUTRITION.

THE recognition that antibiotics can increase the growth rate of animals has thrown a new light on the action of intestinal microflora. E. L. R. Stokstad[1] has reviewed the work that has been done on the effect of administration of antibiotics to young animals. In the search for materials containing relatively large amounts of the "animal protein factor", now known as vitamin B_{12}, crude aureomycin fermentation mash was found to give growth responses in chicks 17% to 25% greater than could be produced by supraoptimal levels of vitamin B_{12}. Similar results were obtained with pigs and turkeys. Later it was found that pure aureomycin and streptomycin produced nearly the same response when vitamin B_{12} was included in the basal ration. Other antibiotics were found to have a similar effect. For chickens the effective amounts of antibiotics employed varied between two and fifty parts per million depending on the antibiotic. Optimum results have been secured with 10 to 20 milligrammes of aureomycin, 10 to 20 milligrammes of "Terramycin", and two to ten milligrammes of penicillin. Antibiotics also increased egg production to a varying extent and hatchability of the eggs. Similar results were obtained in turkeys. Young rats, mice, rabbits and dogs show increased growth rate with aureomycin. Growth responses to antibiotics are larger in the pig than in any other species. The effects are particularly notable in runt pigs, the average growth response being 82%. Baby pigs are very susceptible to digestive disorders, and the pronounced effects of antibiotics may be in large part due to their "disease preventive" action.

The pronounced effect of antibiotics on slow-growing pigs has stimulated interest in the use of antibiotics for slow-growing children. Perrini administered 25 milligrammes of aureomycin per kilogram of body weight per day to ten premature infants. After two days their growth increased, and at the end of the tenth day the average weight of the supplemented infants was 8% above that of the controls. Robinson studied the effect of 50 milligrammes of aureomycin per day in controlled trials with premature twins and triplets. In each case the antibiotic was given to the weaker or weakest member. All but two of the babies who received aureomycin gained more than the controls. During this time five of the fifteen controls died from intercurrent infections, while all the babies receiving aureomycin survived. Carter studied the effects of 75 milligrammes of aureomycin given to children twice a day for periods ranging from one to three years. Twenty children were studied who were suffering from cerebral palsy or were mentally deficient. The group receiving aureomycin gained an average of 6·5 pounds per year, compared with a gain of 1·9 pounds for the controls. There

[1] M. J. AUSTRALIA, February 13, 1954.
[2] *Lancet*, May 22, 1954.

[1] *Physiol. Rev.*, January, 1954.

was also a notable absence of gastro-intestinal upsets, especially diarrhœa, in the group receiving the antibiotic, and of special interest is the observation that there appeared to be no significant development of aureomycin-resistant organisms during the course of the treatment.

The action of antibiotics in increasing growth is confined apparently to its effect on the bacteria within the intestinal tract. This rests primarily on the following observations: (i) Antibiotics and chemotherapeutic agents of widely varying chemical structure are effective. (ii) Antibiotics are ineffective in increasing growth in the germ-free animal. (iii) Aureomycin is ineffective in increasing the growth of the developing chick embryo. (iv) Sanitation influences the magnitude of the antibiotic growth response. The actual mechanism is not known, but certain possibilities may be considered. First, there may be increased bacterial synthesis of essential or stimulatory growth factors. Then there may be inhibition of bacteria which compete with the host for essential nutrients. It is known that one action of the antibiotics is vitamin-sparing, although they cannot replace vitamins. Finally, there is the possibility of inhibition of bacteria which are deleterious. The bulk of evidence is in favour of destruction of deleterious bacteria in the intestine. In support of this is the fact that intravenous injections of antibiotics are without effect on growth.

YAWS AND OXYTETRACYCLINE.

THREE years ago E. H. Loughlin and A. A. Joseph[1] reported their satisfactory experience of the treatment of yaws by oral administration of oxytetracycline ("Terramycin"). They found that when administered orally in doses of one to two grammes once daily for five days this antibiotic induced rapid healing of the lesions of early yaws and quickly rendered them non-infectious. The destructive and crippling lesions of late yaws reacted spectacularly to systemic therapy with oxytetracycline, which was supplemented by topical application of the antibiotic in cases with ulceration. Loughlin and Joseph regarded it at the time as better than any other remedy that they had used previously in the treatment of late yaws and as highly efficacious in the treatment of early yaws. Subsequently, in December, 1951, the study was initiated of the treatment of yaws with a preparation of oxytetracycline given intramuscularly, and Loughlin and Joseph with François Duvalier have now reported their results.[2] The investigation was carried out in Haiti, and the patients were 120 West Indians ranging in age from five months to sixty-nine years. The yaws was early in 108 cases and late in 12. Most of the patients appeared ill, and many complained of headache, fever, malaise, joint pains and stiffness, lassitude, abdominal soreness and insomnia. The special preparation of oxytetracycline was given by a single intramuscular injection once daily for five days in a dosage graded according to age. In appropriate cases, crystalline oxytetracycline was applied topically to lesions in the later stage of treatment. The results obtained were in line with those previously observed after oral therapy. In twenty-four to seventy-two hours after the beginning of treatment, primary and secondary lesions were free of *Treponema pertenue* as demonstrated by phase-contrast microscopy. Usually, by the end of forty-eight hours, the lesions were so dry that no exudate was available for examination. Primary lesions uncomplicated by heavy bacterial contamination and extensive ulceration were dry by the second or third day of treatment, and complete closure with crusting usually was effected by the fifth day after treatment. Fourteen ulcerated primary lesions that were heavily contaminated with bacteria responded to combined intramuscular and topical therapy and healed completely within three to four weeks. Secondary lesions or frambœsiomas of the face, trunk and limbs reacted quickly and were usually covered with crusts or healed within five to seven days.

In two weeks, all that remained of these lesions were hyperpigmented, depigmented or slightly erythematous areas marking their sites. Although more dispersed, the smaller papular and lichenoid frambœsiomas disappeared more rapidly. Perianal and genital condylomatous frambœsiomas were drying within twenty-four to forty-eight hours, and by the end of the treatment were completely dry. Ulcerous plantar lesions, as well as non-ulcerous lesions, which in many instances had been so painful that the patients were unable to walk or even to stand without assistance or support, became considerably less painful within twenty-four hours. In forty-eight to seventy-two hours, the patients were again walking on the affected parts of the soles, and by the fifth or sixth day they had completely useful lower extremities. By the third week, the appearance of the plantar surfaces scarcely resembled those observed prior to the beginning of treatment. The lesions of late yaws responded to the intramuscular therapy in the same dramatic manner as they had done to the oral therapy. Indolent ulcerations healed quickly, especially when systemic intramuscular therapy was supplemented by topical therapy. The progress of gangosa was arrested, and deforming osteoperiostitis, teno-synovitis and dactylitis regressed. The intramuscular therapy consistently reduced the systemic manifestations of yaws within twenty-four hours, and by the end of forty-eight hours the patients felt well. Two patients who later presented themselves were considered to have suffered a relapse, but four others were thought to have been reinfected. No systemic toxic reactions were observed.

Loughlin, Joseph and Duvalier mention three particular advantages of intramuscular over oral oxytetracycline therapy. The first of these is that the treatment of yaws in small children, among whom the incidence of infection is high, can be made easier by the once-daily intramuscular injection of small doses of oxytetracycline. The second is that small doses of oxytetracycline given intramuscularly do not cause gastro-intestinal disturbances and are well tolerated locally at the site of injection. The third is that the small intramuscular doses required to obtain the therapeutic effect should materially reduce the cost of treatment of yaws with oxytetracycline. With ulcerated primary lesions, combined systemic and topical oxytetracycline therapy, unlike the penicillin preparation usually used for this purpose, produces rapid closure and healing, so that the ulcers do not become foci for reinfection. Loughlin, Joseph and Duvalier conclude that the spectacular changes produced in the destructive and deforming lesions of patients with late yaws by oxytetracycline, administered both intramuscularly and orally, clearly demonstrate that this antibiotic is the most effective form of therapy for late yaws. They state that transforming these patients from non-productive cripples to productive members of the community, and arresting in others the progress of advanced destructive lesions, has had remarkable effects on the morale of all the patients. As a matter of fact, when the treated patients were returned to their villages many more were waiting to be taken to the treatment centre, although a yaws eradication campaign with penicillin had recently been conducted in the villages.

GOLDEN JUBILEE OF "THE ANTISEPTIC".

FIFTY years of service both to medicine and to India are marked by the appearance of the golden jubilee number of *The Antiseptic*, a monthly journal of medicine and surgery founded by Dr. U. Rama Rau in 1904. It is a matter of interest that Dr. Rau has been succeeded in the editorial chair first by his son, Dr. U. Krishna Rau, and subsequently by his grandson, Dr. U. Vasudeva Rau. The golden jubilee number, which is a greatly enlarged issue, contains a variety of articles on all aspects of medical and surgical practice, as well as on such related subjects as medical politics, medical journalism and nursing. It is abundantly evident that *The Antiseptic* has played a vigorous part, not only in the development of sound medical knowledge in India, but also in the effective championing of many good causes.

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[1] *Antibiotics & Chemother.*, April, 1951.
[2] *Ibidem*, February, 1954.

Abstracts from Medical Literature.

THERAPEUTICS.

Pseudomonas and Antibiotics.

C. P. ERWIN, B. A. WAISBREN AND R. KRUSE (*Am. J. M. Sc.*, November, 1953) discuss the sensitivity of *Pseudomonas æruginosa* and 38 other strains of Pseudomonas to antibiotics. *Ps. æruginosa* was sensitive to polymyxin, and oxytetracycline was the next most effective drug. Aureomycin, streptomycin, neomycin and chloramphenicol were not so effective. Sometimes *Ps. æruginosa* was resistant to all antibiotics. The authors refer to the danger of treatment with antibiotics of urinary infections which require surgical intervention. In some cases, pyelonephritis with collections of pus was resistant to treatment, and a fatal issue occurred. Polymyxin B was given in doses of 150 milligrammes per day, and oxytetracycline in doses of two milligrammes per day. Other strains of Pseudomonas responded best to chloramphenicol and neomycin.

Diarrhœa.

H. K. GABROY AND G. SELSMAN (*Am. J. Digest. Dis.*, December, 1953) describe the rapid control of uncomplicated diarrhœa with resin. The type of diarrhœa was that in which no apparent cause could be found. It was the diarrhœa prevailing in the community of doctors in private practice in Philadelphia. It was frequently associated with vomiting. Stool examinations were not made in many cases, but the clinical picture was carefully considered, and only patients with uncomplicated diarrhœa were included in the report. Epidemic diarrhœa of this type, of unknown origin, has been reported frequently. In treatment of 20 patients the authors used kaolin 45 grains and pectin one grain. In these cases the diarrhœa ceased in twenty-four to thirty-six hours. Twenty patients were treated with bismuth and paregoric, five minims per dose. Repeated doses did not control the diarrhœa in thirty-six hours in the majority of cases. Resin quickly controlled it. Resin contains polyamine methylene resin, sodium aluminium silicate and magnesium aluminium silicate, which binds toxic amines and bacterial metabolites. Two tablespoon doses were given *statim* and then one every two hours.

The Circulation and Anæsthesia.

S. G. HERSHEY, B. W. ZWEIFACH AND E. A. ROVENSTINE (*Anesthesiology*, May, 1953) have investigated the effects of anæsthetic agents on the peripheral circulation of normal dogs, using direct microscopic examination of omental vessels. Thiopentone, ether and cyclopropane were each administered at three levels of anæsthesia, light, moderate and deep. The state of the circulation was judged by the following criteria: reactivity to adrenaline applied locally, vasomotion of the metarterioles, and precapillaries, calibre of the terminal arterioles, capillary-venous outflow, rate of recovery and blood pressure. The authors state that light ether anæsthesia did not materially affect the vascular responses. Moderate ether anæsthesia affected vasomotion

by shortening the contraction phase of its cyclic activity, but produced no other changes. Deep ether anæsthesia produced very poor adrenaline response and abolished vasomotion; the circulation through the capillary was plethoric, marked arteriolar dilatation and a fall in blood pressure occurred, and there was a lag of some twenty minutes in the return to a normal circulation after lightening of the level of anæsthesia. In light and moderate anæsthesia with cyclopropane there was no depression of the circulation; rather the adrenaline response was stimulated. In deep cyclopropane anæsthesia the adrenaline response returned to normal, and there was reduced vasomotion, capillary-venous flow and arteriolar dilatation, but this was less than with ether. These effects disappeared in about two minutes after the lighter planes of anæsthesia were regained. Light thiopentone anæsthesia produced no changes in the peripheral circulation. Moderate levels of anæsthesia produced definite depression of the circulation and a fall in blood pressure. Deep anæsthesia produced extreme vasodilatation and capillary stasis with a very low blood pressure. Recovery from this state took thirty minutes. The authors consider that as a result of their experimental findings the prevention of the excessive vasoconstriction of shock is not an important or useful role of anæsthetics, but that these experiments rather indicate that the irreversibility is invariably aggravated by these anæsthetic agents. The authors also state that the vascular responses produced by anæsthesia are not identical with those produced by ganglionic blocking agents.

Peptic Ulcer.

S. HYMAN, L. L. HARDT AND F. STEIGMANN (*Am. J. Digest. Dis.*, January, 1954) discuss the treatment of peptic ulcer with aluminium hydroxide and magnesium trisilicate. Tablets containing these preparations were used, "Hypercin" and "Gelusil" being two of the proprietary forms of tablet. The patients were given two tablets four times a day, one hour after meals and at bedtime, in addition to an "ambulatory" ulcer diet, sedatives and antispasmodics. The gastric contents were drawn off at fifteen-minute intervals and the acidity curves recorded, before and after administration of the tablets. It was noted that the acid curve was lower after the tablets were taken. Clinically, response to this treatment was slightly better than with aluminium hydroxide alone, and there was less constipation.

Regional Ileitis and Ulcerative Colitis.

S. WARREN AND S. C. SOMMERS (*J.A.M.A.*, January 16, 1954) describe the pathology of regional ileitis and ulcerative colitis. They state that the former is a thickening of the intestinal wall and mesentery, which contains soft enlarged lymph nodes. It is mainly confined to the ileum (85% of cases). Radiologically, a narrowed barium stream in the affected area gives the "string sign". Fistulæ may form, but if there is no operation, as for appendicitis, healing usually occurs. There is a progressive granulomatous lymphangitis of the ileum with thickening and œdema. The condition simulates tuberculosis, but there are no acid-fast bacilli and no caseous necrosis. Mucosal ulcers occur. Perforation of the intestine

is unusual, and death is rare. The cause is unknown. Ulcerative colitis may have a specific cause, such as amœbiasis, bacillary dysentery, *lymphopathia venereum*, mercury poisoning, uræmia or vitamin deficiency. It affects the colon in 70% of cases. The ileum is affected in 30%. There is redness, often widespread ulceration and spasticity of the colon. The spasm of colonic muscle leads to loss of haustration, giving a smooth radiological appearance of the lumen after barium enema and a "lead pipe" colon. The transverse, descending and sigmoid parts of the colon are involved in 80% of cases, the cæcum, ascending colon and rectum in 65%. Microscopically, the ulcers are found to affect mainly the mucosa and submucosa. Perforation of the colon with peritonitis occurs in some 4% of cases. Ulcerative colitis may be associated with arthritis, nephritis, dermatitis, thrombophlebitis, hepatitis and neuropsychiatric conditions. It is probably a disease of the whole body. This contrasts with regional ileitis, in which only the intestine, mesentery, lymph nodes and liver appear to be involved.

Gout.

W. S. HOFFMAN (*J.A.M.A.*, January 16, 1954) discusses uric acid metabolism and gout. He states that the acute attack is due to the precipitation of sodium urate in and around joints. Colchicine, grain 1/120, given every two to four hours, usually produces remission in forty-eight hours. Probenecid or p-(dipropylsulphamyl) benzoic acid is said to prevent retention of urates; given in doses of 0·5 to 1·0 gramme daily for several weeks it lowers the plasma urate level by increasing excretion. If colchicine (grain 1/120) is given three or four times a day at the same time, acute attacks can be avoided. The author states that chronic gouty subjects lose their tophi and become active while receiving probenecid as a result of increased excretion of urates. At the same time, colchicine is necessary to prevent acute attacks of gout.

Liver Biopsy in Rheumatoid Arthritis.

E. R. MOVITT AND A. E. DAVIS (*Am. J. M. Sc.*, November, 1953) describe a series of investigations of liver biopsy in cases of rheumatoid arthritis. Seventeen patients between the ages of twenty-six and fifty-three years with rheumatoid arthritis or spondylitis were investigated by liver biopsy. In general, little or no abnormality was detected. Serum globulin and γ globulin contents were increased in half the cases, but the authors do not consider this significant. The findings from cephalin flocculation tests were generally within normal range. The authors conclude that liver function is little affected in rheumatoid arthritis.

Shigellosis and Salmonellosis.

O. FELSENFELD (*Am. J. Digest. Dis.*, December, 1953) describes the bacteriological investigation of shigellosis and salmonellosis in Cook County, Illinois. A total of 1030 salmonella and shigella strains were isolated from patients between 1948 and 1953. *Sh. sonnei* predominated, followed by *Sh. paradysenteriæ*, *Sh. Flexneri* ii, *Sh. alkalescens* and others. *Salmonella typhimurium and S. typhosa* occurred frequently. The organisms were most

frequently isolated from the stools, but blood, spinal fluid, urine and pus were other sources. All the patients were in hospital, so that probably many salmonella infections occurred which were not investigated. All age groups were affected. Fever was noted in some cases, but was absent in a large proportion. Sulphonamides and antibiotics were used in many cases. These often suppressed fever and stopped prolonged diarrhœa. Penicillin especially caused aberrations in the usual course of the disease. Diarrhœa often occurred, but sometimes was absent. Blood in the stools and enlarged spleen were also noted. The authors were struck by the absence of typical signs, especially in the typhoid group.

The Treatment of Epilepsy with "Mysoline".

L. GREENSTEIN AND M. R. SAPIRSTEIN (*Arch. Neurol. & Psychiat.*, October, 1953) discuss a series of 30 cases of epilepsy in which "Mysoline" was added to other anticonvulsants in the treatment of 28 patients and was the only drug employed with two others. "Mysoline" was effective in patients with major and focal seizures, either alone or combined. In 78% of these cases the patient's condition improved. No effect was observed on the number or frequency of psychomotor seizures, and "Mysoline" appears to increase the frequency and number of *petit mal* seizures. The commonest side-effects were (*a*) a feeling of drowsiness, drunkenness, and lethargy, relieved in most instances by the addition of "Benzedrine", (*b*) a papulo-vesicular eczematoid eruption, which promptly subsided with decrease in dosage and did not reappear upon resumption of the original dose, and (*c*) an acute vestibular reaction following the ingestion of the first "Mysoline" tablet and characterized by intense vertigo, nausea, vomiting, severe ataxia, nystagmus and, in one instance, vasomotor collapse. No blood dyscrasias or abnormal urinary findings were observed.

NEUROLOGY AND PSYCHIATRY.

Neuropsychiatric Aspects of Infantile Eczema.

MAURICE J. ROSENTHAL (*Arch. Neurol. & Psychiat.*, October, 1953) discusses his findings and hypotheses concerning the pathology and pathogenesis of nonallergic infantile eczema. He states that much of the material discussed may be as relevant to eczema in older children and adults as it is to infants. Nothing discussed in the paper excludes the possibility of coexisting allergies. In cases of eczema in which there is also an allergic factor the allergic and non-allergic ætiological factors stressed may be synergistic. On the other hand no one has ever demonstrated that allergy is a factor in all cases, and the author's theory offers an explanation of how infantile eczema may develop in the absence of allergy. He states that infantile eczema develops as an attempt to shield the most sensitive exposed portions of the infant's skin from real or anticipated injury and, correspondingly, from unpleasant external stimuli. An important reason for initiating the unfortunate adaptive process in the skin is thought to be the lack of soothing skin experiences in these infants. Their mothers tend to avoid physical contacts with them, and for such infants there would be an inadequate counterbalancing of unpleasant skin experiences with the pleasant ones. A state then develops which ultimately would tend to make them avoid most stimuli from the environment. The pre-eczematous child is thought to react as though he was frequently experiencing or about to experience pain in the skin. Vesiculation would be an adaptive response, since it would tend to protect the tissue elements. It would also dilute pain substances if any were liberated by external injury to epidermal cells. Finally the author quotes from another authority: "The most fruitful etiological approach is that which considers infantile eczema the result of the maladjustment of the skin to the radical changes of environment which occurred when the baby moved from the uterus into the world."

Electro-Convulsive Therapy and Drug Addiction.

F. B. THIGPEN, C. H. THIGPEN AND H. M. CHECKLEY (*Arch. Neurol. & Psychiat.*, October, 1953) discuss the use of electro-convulsive therapy in the treatment of drug addiction. They state that in their experience they have found it uniformly effective. They refer to recently expressed opinions that statistical evidence has not been presented to justify this method, and they present a series of cases in the hope that others may use a treatment that they have found safe and valuable. In the authors' opinion additional studies should be made until ample statistical evidence is available to evaluate electro-convulsive therapy as a means of alleviating withdrawal symptoms.

Pathological Basis of "Post-Traumatic Syndrome".

ADAMS A. McCONNELL (*Brain*, Vol. 76, Part III, 1953) details his findings in 75 consecutive cases of "post-traumatic syndrome" in which the patients were subjected to bilateral openings in the skull. They were patients who were not getting well in varying stages, after closed head injuries. The patients complained of headache alone, of headache and giddiness, or of headache, giddiness and some degree of mental disability, such as faulty memory, inability to concentrate and nervousness. Some were depressed and morose. Ten were involved in compensation cases with litigation pending. The one feature common to all these patients at operation was a definite elevation of intracranial pressure. The brain appeared tight, with little or no pulsation; and when fluid was found, it escaped under pressure from within. In spite of the unmistakable pressure demonstrated at operation the pressure of cerebro-spinal fluid on lumbar puncture was never increased, and papillœdema was absent. The results of removal of subdural fluid were uniformly good, even when symptoms had persisted for years. The giddiness and mental symptoms usually disappeared with the headache. Ten patients after initial relief had a recurrence of symptoms a week or more after operation. The wounds were reopened, and a further accumulation of fluid was found. The general conclusion reached is that the pathological basis of the post-traumatic syndrome is a chronic elevation of intracranial pressure due in 80% of cases to a leakage of cerebro-spinal fluid into the subdural space. This fluid accumulation can be demonstrated by the second-day encephalogram, as most of the insufflated air accumulates in the subdural space after twenty-four hours and produces a definite fluid level. The fluid can be removed through burr holes in the skull.

Thiamylal and Electro-Convulsive Therapy.

R. S. GREEN AND R. LEISER (*Arch. Neurol. & Psychiat.*, June, 1953) describe a series of 20 cases in which the patients received both electroconvulsive treatment and thiamylal ("Surital") preceding the electroconvulsive treatment. From their studies they conclude that thiamylal changes the seizure by shortening its duration and by prolonging the postseizure apnœa. The total period of apnœa tends to remain constant, both with and without thiamylal, but thiamylal given prior to electro-shock helps in preventing pre-treatment apprehension and post-convulsive excitement. The authors also state that the psychiatric improvement in patients receiving thiamylal-electroshock therapy was essentially that expected after treatment with electroconvulsive therapy alone. The authors propose a theory that peripheral convulsion in electro-shock is independent of the respiratory arrest, and that these two phases are mediated through different brain centres. They present data in support of this theory.

Psychotic Reactions in Problem Drinkers Under Treatment with "Anatabus".

E. A. MACKLIN, A. SIMON AND G. H. CROOK (*Arch. Neurol. & Psychiat.*, April, 1953) report ten cases of alcoholism in which psychotic reactions occurred during treatment with "Disulfiram" ("Antabus"). The ten cases are described in detail, and the literature on similar previous cases is discussed with particular emphasis on the divergence of opinion concerning the principal ætiological factors. The authors believe that the primary factor in the production of the psychotic episode is psychogenic, and that "Antabus" toxicity plays a secondary role. The authors also discuss the importance of this fact as it affects the treatment of those patients who incur psychotic reactions while receiving "Antabus".

Mobilization of Glucose by Phlorhizin in Patients with Mental Disorders.

M. D. ALTSCHULE, H. U. GRUNEBAUM, B. H. PARKHURST AND E. P. SIEGEL (*Arch. Neurol. & Psychiat.*, August, 1953) have investigated the carbohydrate metabolism in patients with mental disease before and after treatment. The metabolism of glucose was studied after the giving of injections of phlorhizin. The amount of glucose excreted was within normal range, but changes in blood sugar level during the test indicated that mobilization of carbohydrate is sluggish in some of these patients; this abnormality apparently involves processes other than adrenaline-induced hepatic glycogenolysis.

Special Articles for the Clinician.

CII.
INGROWING TOE-NAILS.

"INGROWING TOE-NAILS" is an affliction of the human race which has arisen since the custom of wearing socks or stockings became fashionable. In order to lessen the holes which seem to be inseparable from the wearing of these items, it became the custom to cut the big toe-nail, and the first step towards the development of this tiresome malady was taken.

Amongst most people the tendency is to cut the toe-nails in a curve more or less parallel to the curve of the tip of the toe. There is no harm in this provided the nail is not cut short—that is, the edges should be allowed to protrude beyond the limits of the lateral nail folds. If, however, the nails are cut short, so that the edges do not protrude, there is a tendency not to complete the cut right to the edge of the nail. A small section remains covered by the nail fold and, not being cut, continues to be pushed distally by the continued growth of the nail. Thus a "spike" is formed (Figure I), and with continued growth it buries itself in the overhanging nail fold, causing ulceration and low-grade infection. If it remains inadequately treated, the infection increases, resulting in proliferation of fibrous tissue and epithelium, and a large bulging nail fold. This in turn makes nail trimming more painful, difficult and ineffective.
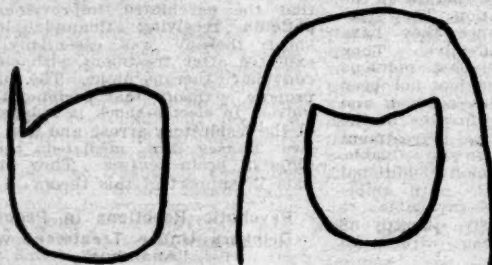

FIGURE I.   FIGURE II.

In addition there is a congenital factor associated with the shape of the nails. Some nails are so curved and malformed that the development of symptoms, sooner or later, is almost inevitable.

Treatment.
Prevention.

Tight-fitting and pointed shoes, by causing pressure on the lateral side of the toes, undoubtedly play a part in causing this condition and should be avoided. Proper care and cleanliness of the feet reduce proliferation and the risk of infection, but adequate cutting of the nail itself is the most important factor. If the nail is allowed to grow so that the margins protrude beyond the nail folds, it does not matter much how the nail is cut; but it has been recommended that they should be cut proximally towards the centre (Figure II), and this is good practice, especially if the nail is abnormally curved.

Conservative Treatment.

In an early case with early "spike" development, it is usually possible to effect a cure by conservative methods. Strands of lint or pledgets of cotton wool are packed into the nail fold and left for a few days. The procedure is repeated until the overhanging fold has been pushed back sufficiently to expose the lateral edge of the nail. If the spike is seen, it is cut off; but in any case the fold must be kept packed back until the nail grows beyond its bounds. Only proper cutting of the nail is then required to prevent recurrence. Other methods sometimes of some assistance are: (i) cutting a groove in the length of the nail just in from the margin, and (ii) scraping the dorsum of the nail thin.

Surgical Treatment.

In the later cases, and especially when the nail itself is highly curved, operation is usually the best treatment.

A wedge resection may be performed, but this is probably only worth while in young people. The lateral quarter of the nail and the overhanging fold are removed to beyond the proximal end of the nail bed. The raw area heals by granulation and epithelialization from the edges.

In older folk it is quicker and less troublesome for the patient if the nail is removed completely.

Partial amputation of the distal phalanx has been popular, and its only disadvantage is that it leaves a shortened big toe. The nail and its bed are removed, and sufficient of the phalanx is nipped off to allow the pulp of the toe to be
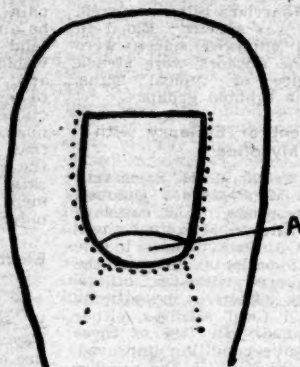

FIGURE III.   A: Lunula.

stitched to the raw edge of the proximal nail fold. Occasional complications to the operation are the occurrence of an inclusion cyst if the skin is not completely removed from the turned-in portion of the folds, and the formation of spicules of nail if the nail bed has been incompletely removed.

Recently an operation has been described by F. R. Zadik (1950) which has been found to remove the nail just as effectively as the previous operation, and it avoids the disadvantage of shortening the toe. Zadik points out that "growth of the nail, both in length and thickness, takes place only from the proximal part of the nail bed. The
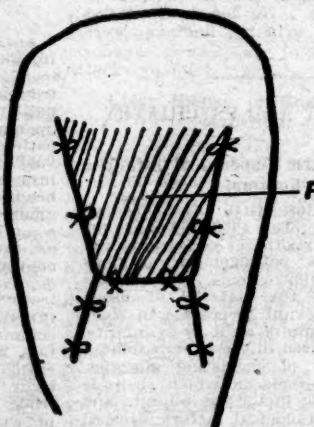
FIGURE IV.   A: Distal nail bed.

nail bed distal to the lunula makes no contribution and, if growth of the nail over it is prevented, it will assume the characteristics of normal skin". A "U" cut is made round the nail, being kept just inside the nail fold in order to preserve as much skin as possible, with two proximal elongations which make it into an "H" (Figure III). The proximal portion is raised as a flap, and the nail is then avulsed. The thick fibrous-looking nail bed is thus exposed and is divided transversely at the distal edge of the lunula. The proximal portion is carefully dissected out as far back as

the extensor tendon insertion and on each side to the plantar surface of the bony phalanx. If the lateral nail folds are deep, they are excised, care being taken not to leave isolated pockets of skin in the depths. The raw edges are then apposed and sutured (Figure IV). Healing takes place rapidly and the patient is cured. If there is much infection present, it may be necessary to avulse the nail as a first stage and carry out the plastic procedure two weeks later.

<div align="right">A. L. DAWKINS,
Perth.</div>

References.

GILMOUR, W. N., personal communication.

ZADIK, F. R. (1950), "Obliteration of the Nail Bed of the Great Toe without Shortening the Terminal Phalanx", *J. Bone & Joint Surg.*, 32-B: 66.

Correspondence.

THE FELLOWSHIP OF CHRISTIAN HEALING.

SIR: "The ætiology of disease is not from morbidness of spirit, it is a matter of cell pathology." Is that a logical proposition?   After the Japanese had built the South Manchurian Railway they forced the Chinese to promise not to build a parallel railway. When the Chinese began constructing such a railway, the Japanese objected. The Chinese replied: "Our railway is not parallel, it is 90 miles away!" "Not spirit; cell pathology."

I believe that the proximal basis of disease symptoms is cell pathology, and as this letter is written in the context of exception taken to New Testament ætiology, it is proper to state that my conviction is that those cases which we call "psychotic" (that is, disease of the "psyche" or soul) are identical with, and have a common brain pathology with the cases which the New Testament describes as "demoniac" (that is, possession or obsession with an evil "pneuma" or spirit). So what? Human beings, whose nature is to form achieving purposes, exercise choice and differentiate between good and evil, are thereby constrained to look beyond material and proximal causes for a *Vera Causa*. The Christian faith affirms that the *Vera Causa* of the cosmos is Good and Almighty Spirit, representing spirit in terms of (*a*) the energy of conscious purpose, (*b*) freedom, (*c*) differentiating between good and evil. Whence then evil in a cosmos created "very good"? Intellectual resolution of that mystery is not provided; instead the New Testament calls to the overcoming of evil. Jesus in a moment of exultation once said: "I saw Satan fallen."

Historically, belief in good and evil spirit has been corrupted by (*a*) magic and (*b*) superstition. Magic assumes some easy way of controlling nature and overcoming evil; hence its spells, its facile invocations and its wishful rites. The materialist repudiates magic: nevertheless attitudes often emerge in him, to democracy, revolution and science, which are essentially magical. Superstition is "credulity regarding the supernatural, irrational fear of the unknown and the mysterious". Animism believes in capricious spirits able harmfully to disrupt nature. Animists live in dread of evil spirits whom they seek to appease or, alternately, overcome by magic. All such ideas are foreign to the New Testament, though it warns that man is prone to deception and seduction by evil spirit; and, since we humans are materio-spiritual creatures, the consequences of seduction appear not only in our spirits but also in our bodies and through them in nature. These New Testament affirmations have relevant, if unsavoury, confirmation in the phenomena of spiritualism and its mediums.

The New Testament rejection of superstition carries with it dismissal of fears and liberation from paralysing pessimism; but there is no rebound into magic. True, it bears record about "wonderful works" performed by Jesus. It soberly relates how a naked maniac, who had raved at Jesus, was seen later "clothed and in his right mind". It tells how a demented epileptic (the symptoms described with singular accuracy) was restored. Thus Jesus demonstrated the truth of those prescient words of His, which science begins to believe. "It (nature) would have obeyed you." But only under certain prescribed conditions which reject magic. The conditions—complete spiritual commitment, unsparing effort and use of appropriate available means.

Thus in the supreme crisis of His own life, Jesus prayed, with "sweat like great drops of blood", "Thy will, not mine,

be done"; and went on to make with four nails, two pieces of wood and a naked body, an instrument with which He achieved His sublime purpose.

<div align="right">Yours, etc.,
CHAS. I. McLAREN.</div>

Melbourne.
Undated.

SIR: Carefully considered and well-balanced criticism is always welcome and must result eventually in an increase of knowledge for both the criticized and the critic. It is for this reason that the letter from Dr. Walter J. Hull (April 24, 1954), and several by other writers later, are greatly appreciated, since it is evident that a great deal of time and thought have been given by your correspondents in expressing their opinions of the Fellowship of Christian Healing.

However, I feel that Dr. Hull has an entirely erroneous conception of the aims and objects of the Fellowship when he speaks of "an unholy alliance for the medical profession to enter into with the theologians for the alleviation of suffering", and "to give chaplains a bastard course in medicine, creating an army of quacks with an official backing".

Any fears he and others may have in this direction can be immediately dispelled, since a better understanding between the clergy and the doctors and a closer liaison between the members of the two professions in their common task of doing what is best for the healing of the patient in his body, mind and soul will at once prevent the development of "quacks" and "faith healers" in either profession. The doctors have no more desire to usurp the role of the clergy than have the priests to be regarded as glorified doctors.

Just as the Council of the Parent Body of the British Medical Association in England in 1947 accorded official recognition to the Churches' Council of Healing and appointed a panel of doctors to help and advise, so under exactly analogous conditions did the Council of the British Medical Association (Victorian Branch) in 1953 approve of similar principles in the recognition of the Fellowship of Christian Healing and also appoint six members of the profession as a medical advisory panel to the Fellowship.

There is little further to add to Dr. B. H. Peterson's letter in reply (May 22, 1954) except for me to affirm that the publication in full of the report in the *British Medical Journal*, November 8, 1947 (Supplement), page 112, should you be able to grant the necessary space, would be of the greatest value to all members of our profession in explaining in more detail the objectives of the organization and the advantages for the patient when the members of the two professions are working in the closest harmony and with complete understanding by each of the other's viewpoint.

In conclusion, may I quote a reference by the Right Reverend Bishop Donald Baker, the Chairman of the Fellowship, in one of his discussions on the subject: "May we not make this claim, if there be, as a majority of people consider true, a supreme benevolent Being, Who cares for His creatures, and further if the mind can influence the body, what could be more natural, more obvious, than for this supreme benevolent Being to answer to the requests of His creatures (which we call prayers) to strengthen the mind, to fortify the spirit, for the control and indeed the healing of the body?"

Thanking you very much indeed for your generosity in space for the report of the meeting and for the subsequent correspondence.

<div align="right">Yours, etc.,
ROBERT SOUTHBY.</div>

33 Collins Street,
Melbourne,
May 31, 1954.

[This correspondence is now closed.—EDITOR.]

Obituary.

EDWARD THOMAS BRENNAN.

THE death of Edward Thomas Brennan, D.S.O., M.C., M.B., B.S. (Melbourne), D.T.M. (Sydney), which occurred at Cronulla, near Sydney, in August, 1953, removed an honoured and vivid personality from the Australian medical scene. Tom Brennan had wide affiliations—for he was perhaps the

most experienced Australian tropical medical administrator, he was one of the best known men in New Guinea and the South-West Pacific, he was a distinguished veteran of the two wars, and he was known to medical colleagues in all parts of Australia. He is consequently widely mourned.

Brennan was born at Stawell, Victoria, on April 13, 1887, and spent his youth in the picturesque Victorian township of Beechworth. He attended the Beechworth Grammar School and later received his medical education at the University of Melbourne, where he was a student of Trinity College. His student days were a pattern of his future life: he seemed to be in everything, knew and was liked by everybody, and lived an apparently carefree existence, while yet proving his ability.

He graduated in 1909, and after a year as resident medical officer at the Ballarat Hospital, joined the staff of the Fremantle Hospital, where he became medical superintendent. He remained at Fremantle until 1914, when he enlisted in the army at the outbreak of the first World War.

There can have been few medical officers of the First Australian Imperial Force who were better known than Tom Brennan. He enlisted in 1914 and was the original regimental medical officer of the Eleventh Battalion. This was part of the Third Infantry Brigade, which made the first assault on Gallipoli on April 25, 1915. In the rough and tumble of the landing and the subsequent advances and withdrawals, units were greatly mixed up. Brennan established a regimental aid post at the steep cliff of Steele's Post, where the only means of evacuation of wounded was down a sandslide into Monash Gully. It is recorded in the Official History that "he took the ration bags from the wounded as they came down the slide and sent back food and water by men going up again".

On May 4 he took part in a desperate enterprise for which he had volunteered. A reconnaissance and raiding party had been specially chosen from the Eleventh Battalion under Captain (later General) Leane, which was to land from boats on the beach below Gaba Tepe, a prominent exposed point some distance south of the Australian line and an important Turkish observation post. Brennan with his stretcher-bearers landed at dawn with the infantry, and they all raced across the beach under heavy fire to a bank where he formed an aid post. Some men were killed and wounded, and Leane, finding that he could not advance beyond the bank, signalled the navy to send boats again for a withdrawal. Heavy casualties were expected as the medical officers and stretcher-bearers with wounded crossed the beach to the boats, but, as the Official History says, "to the surprise of all, the Turks did not during the embarkation, fire a shot at the wounded men or those assisting them".

Brennan was always a cheery, spirited, make-the-best-of-it companion and friend of everybody; and in those hot and thirsty days of Gallipoli's summer he was the life of the party along his front, and his morale-lifting enthusiasms and personal interest in officers and men were worth a regiment. On many a morning headquarters on the beach would receive a deputation, in the form of the medical orderly from the Eleventh Battalion, requesting urgently medical comforts (and don't forget the rum) for the walking sick and wounded "who don't want to be evacuated". Brennan was regarded by his senior officers as the perfect regimental medical officer; and was held by all ranks of his unit, as of those he later commanded, in admiration and affection.

After Gallipoli Brennan was promoted to the rank of major and served in France with the Seventh Australian Field Ambulance, and later was lieutenant-colonel commanding the First Australian Field Ambulance. He was in all the big and little pushes of the Australian front, the Somme, Hindenburg Line, Passchendaele and the rest. He always wanted to be in the thick of everything. One of us remembers him dropping in one day in 1917 much excited: "They say the Germans have retreated from Bapaume. Let us go up and see the place. It will be out of bounds for us, of course, but we can make it." As he expected, it proved to be an interesting and thrilling interlude, with humorous accompaniments. When out of the line he instituted early morning cross-country runs for all who would go, himself participating. For his gallantry he was awarded the Military Cross and later the Distinguished Service Order, and was four times mentioned in dispatches. To many who look back to the first World War and its gallery of medical officers, Tom Brennan is the first to spring into memory; and all would proclaim him the winner of the supreme laurels of a war doctor—the affectionate memory of all, without exception, who served with him.

After his discharge from the army, Brennan joined the Royal Australian Navy, and was for two years surgeon in H.M.A.S. *Sydney*. During this time he became acquainted with the charming American woman, Miss Ruth Todd, of Tarrytown, New York, who later became his wife. He left the navy to join the medical service of the Territory of New Guinea, in which he was to serve with distinction for almost twenty years. The former German colony, occupied by Australia early in the war, was now held under mandate, and his service commenced in the difficult formative years of the new administration.

During the first two years of his service in New Guinea Brennan held the position of travelling medical officer, which, for its action and adventure, suited him well. A 45-foot schooner, the *Lady Betty*, had been refitted for his use, and with an all-native crew he sailed round the scattered islands and the coast of the New Guinea mainland on his medical work. During this period his future wife arrived from New York, and they were married at Rabaul, and spent the first two years of their exceedingly happy married life with the little ship for their home. A colleague of those days remembers the pride and satisfaction which Brennan invariably radiated over everything that concerned his work and his new command, feelings which were joyfully shared by his wife. He had a navigator's qualification and was captain and engineer of the craft; so, as he said, a nautical beard was warranted. His enthusiasm for the tropical seas remained undiminished by trying adventures among the treacherous reefs of Melanesia.

He was later stationed at Madang, in charge of the mainland division of the medical service. Here the opportunity arose to display again the administrative ability for which he had gained a reputation during his war service. Under hard pioneering conditions and isolation he also constantly displayed the *æquanimitas* and joy of living that, together with helpfulness to others, were his hall-marks. A brother officer, recalling a visit from Brennan to his isolated station at this time, writes: "He came breezing in on a gust of enthusiasm, pleased with everything—the view, the bungalow, the sea-breeze—even the food. The expression *joie de vivre* had meaning for Brennan, and he let some of it overflow to his fellows. To the tropic dweller of some years' standing, soured by service frustrations that Brennan could brush off with a laugh, he was as good as a holiday."

The kerosene refrigerator was introduced to the Territory during his Madang days, and though life had been sweet to him before, it seemed that, with hard butter for breakfast and cold drinks at night, its last minor blemishes had vanished. For Brennan was something of a gourmet—though never a gourmand. Any day for him could be a feast day, and any place a possible site for carnival. So his laughter and good company were as unmeasured in bush camps and lonely posts as they had been on the hillsides of Gallipoli and the battlefields of France, or in the more luxurious settings of Ciro's and the Ritz, the Imperial Services Club or his homes at Rabaul and Cronulla.

In 1928 Brennan was appointed Director of Public Health for the Territory, and in 1933 a Member of the Legislative Council of New Guinea. He held these positions till the Japanese invasion in 1942. The added responsibility sat easily upon him, and the assumption of authority altered his genial bearing not a whit. He was a clear-thinking, direct administrator of the type of his old friend, Field Marshal Sir Thomas Blamey. He made quick and apparently effortless decisions, expected rapid action, and supported and encouraged the work. As one of his officers said, "he had a remarkable aptitude for grasping essentials and coming to a quick decision—usually the right one—settling a problem between one cigarette and the next that would give lesser mortals days of agonising indecision. This had its disconcerting side for the slow-witted. For one would go to him with a half-baked plan for discussion, but before one had more than broached the subject he was likely to be on the telephone making arrangements for immediate action—that is if he approved. If not, one would soon know about that too". His work was done without show or fuss or posturing and with a minimum of paper, and it lacked long pondering and furrowed brow. And so, to those who knew nothing of his wide responsibilities, and the difficulties inherent in the scattered islands and their primitive peoples, and the trials of staff and finance in building his service, his job seemed easy. For he always had time and good humour. He was a most satisfactory man to work for, and inspired respect and loyalty in his staff.

His headquarters were now at Rabaul, and his residence on the hill at Namanula, with its sweeping view, was a place of happy family life, good cheer and gracious hospitality. The Brennans' eldest daughter, Betty Anne, had been born at Madang and her sister Mary in the United States. The youngest of their three girls, Dorothy, was

now born at Rabaul, completing the devoted family. Brennan travelled widely during his leave periods—to the East and Europe, to the United States, where Mrs. Brennan's family resides, and to Melbourne, the home of his own people.

Brennan liked the native people and they liked him, and this formed a solid foundation for his work amongst them. He was interested in them as human beings, and they were his charges and patients, quite apart from the interest he took in their culture and institutions. He treated them with his characteristic courtesy and goodwill, and did not regard them as children, or as some lesser beings. They always knew where they stood with him, and even in the worst conditions he lacked the impatience and irritability that are only too likely to arise in response to their deviousness and opposition. The numerous native assistants and servants, police, village councillors and others with whom he was well acquainted brought their troubles to him, and sought his advice on all sorts of problems. He always knew about their families and affairs, and wherever he went there were seemingly interminable conversations in pidgin with native friends. On a visit to his war-devastated territories after the war, he was greeted with affecting joy wherever he went. In places he knew, it appeared that he remembered all the names on the census lists, as he asked after this one and that, openly mourning with them the lost ones of the unhappy years of enemy occupation. It is certain that, in Melanesia, nobody could ever hold more adequately his honoured title of "the big doctor".

At the outbreak of the second World War, Brennan enthusiastically sought a post in the Australian Imperial Force, and one was readily kept open for him. But his physical condition no longer fitted him for active service; so, after exhausting every means he could think of, he reluctantly returned to New Guinea. In 1940 he sent his family to Australia, and combined military duties with his usual work. On the threat of invasion, he was appointed Assistant Director of Medical Services, with the rank of colonel, at Port Moresby. Rabaul fell to the Japanese soon after he left it, and most of his local friends lost their lives, either in the assault or at sea during their evacuation as prisoners. In the strenuous months that followed, during the establishment of Port Moresby as a fortress and advanced operational base, Brennan suffered severely from a vascular condition of the legs that had caused his rejection for active service earlier. He steadily refused to be relieved and remained on duty until he was finally not able to walk, and it was feared that the amputation of a leg would be necessary. He was evacuated by air to Sydney, where he remained in the Concord Military Hospital for many months, and was then discharged from the army.

Through this trying period his blithe spirit was not quenched, and he was no sooner able to get about again, albeit with some distress, than he sought work. He at once received the position of Deputy Director of Medical Services for the Allied Works Council in New South Wales, for which his experience especially fitted him, and remained in this post until it was abolished in 1945. Within a short time he was chosen as Chief Medical Officer for U.N.R.R.A. in the South-West Pacific, and subsequently received appointment with the Repatriation Department in Sydney. In 1950 Brennan visited Papua and New Guinea as a member of a Commonwealth Advisory Committee on the hospital services. His fellow members were his tropical friends, the late W. B. Kirkland and John Gunther, and his useful tour, on which he revisited old scenes and renewed old friendships, was one of undiluted happiness.

Brennan was a keen and competent doctor, and though his work was mainly administrative in later days, he retained his interest in clinical medicine. He was not an academic type, though he ardently fostered research in the Territory during his term of office. Field workers who visited New Guinea gratefully remember his warm welcome and unstinted help and encouragement. He was interested in education for tropical medical officers, and lectured at the School of Public Health and Tropical Medicine. For many years he was a member of the Advisory Council of the School.

Brennan was intensely interested in people and had friends in all walks of life. Though essentially a man of action, he loved talk; but it was talk concerned with action. Philosophical discussion had little appeal for one so full of life that speculation about its meaning would seem but waste of breath. Like Goethe's Egmont his fashion was to live generously, and he might have agreed with Egmont that "he is already dead who lives for his own safety", or asked himself "Do I live merely to think about life?". He did not readily express his inner beliefs or aspirations, and it always seemed that these, too, were translated into action and expressed in his open-hearted, generous and helpful life.

It is not possible to think of anyone who lived life more fully, or with greater appreciation for its essential goodnesses; and as he freely gave friendship and service, so he reaped love and appreciation. Increasing illness and distress, in his later days, did not dampen his enthusiasms, and knowing only too well the hazards that beset him, he remained undaunted and content. He is deeply mourned—by his wife and daughters, by his brother, Dr. Kevin Brennan, Chief Health Officer for Victoria, and other members of his family, and by a very wide circle of devoted friends. They will never forget him, for, as an old friend said, "It seemed that the Town got darker when he went".

LESLIE JACK CLENDINNEN.

DR. COLIN MACDONALD has forwarded the following appreciation of the late Dr. Leslie Jack Clendinnen.

The death on January 24 of this year of Leslie Jack Clendinnen, at the age of sixty-six years, severs a direct connexion with the beginnings of X-ray and radium practice in Australia. His grandfather, a Scot, arrived in Australia in 1851. His father was Dr. Frederick Jack Clendinnen, internationally acclaimed as amongst the very first to use X rays and radium. In the select roll of honour in the hall of the *Fondation Béclère* in Paris appear the Australian names of Clendinnen, Harris and Hewlett, as men whose work for early radiology should always be remembered. F. J. Clendinnen and Herbert Hewlett (happily still living in Melbourne) were Victoria's pioneer medical radiologists, both of them producing radiographs in early 1896; the former had been experimenting with Geissler tubes before Röntgen's great discovery in November, 1895, and may well have produced X rays unknowingly before that date. Clendinnen, senior, was possessed of a considerable inventiveness; amongst the several appliances he originated were an electrical coin catcher for removing coins and buttons from the œsophagus, and he also invented an automatic telephone, adopted by the Government and said to have been most successful. By contrast with X-ray apparatus of today, which necessitates an expenditure of many thousands of pounds, his first X-ray plant was purchased for £5 13s. 9d. Though today's equipment is a thousand times more expensive, it can with satisfaction be said that its reliability and usefulness have increased in about the same ratio.

L. J. Clendinnen—always known as Jack Clendinnen—received his secondary education at the Melbourne Grammar School during the headmastership of G. E. Blanch and later qualified M.B. in the University of Melbourne. His final year of 1910 has been termed an *annus mirabilis* of the Melbourne Medical School because of its galaxy of men who later achieved eminence. Sir Alan Newton, Sir Victor Hurley, Sir Samuel Burston, Upjohn, Felstead and Fairley were included in this brilliant year.

Clendinnen became assistant to his father at 105 Collins Street, and the groundwork of his radiology was provided by a father-son apprenticeship, there being no radiological diplomas or other systematic post-graduate instruction in those days—the Cambridge diploma, the first of the British qualifications, was not instituted until 1920.

Clendinnen, junior, had early seen that if the best use was to be made of radium therapy, he should undertake a surgical training, and to this end he had arranged to proceed to London with the F.R.C.S, as his aim; but Frederick Clendinnen dying in London in 1913 whilst attending the International Medical Congress, his son had to abandon the surgical future to carry on singlehanded the increasingly large practice in Collins Street, and he was forced to work extremely hard. Clendinnen volunteered for overseas service on the outbreak of World War I, but there were at that time only four radiologists in Melbourne; Argyle and Dennis were accepted in the Australian Imperial Force, and Clendinnen and Hewlett had to remain. The heavy public hospital work—Jack having taken over his father's position as honorary skiagraphist to the Melbourne Hospital—was augmented by increasing labour at the Caulfield Military Hospital. X-ray protection was not then sufficiently well understood, and fluoroscopy was greatly in favour, with the result that Clendinnen acquired a radiation dermatitis, to be borne for over thirty years, and necessitating the loss of a finger from each hand; his father too had suffered a similar fate. Sometimes today, when so many medical men—apart from radiological specialists—are able to make quick use of the safe and efficient modern apparatus, it is not always appreciated how such facility with this diagnostic aid has been bought by the health of the early radiologists.

That Major-General Fetherston, the then director-general of medical services, was never able to spare him for overseas service was a great disappointment to Clendinnen for the rest of his life; he found little consolation in the observation that he was doing indispensable work at home. As soon as relief was obtainable for the Caulfield Military Hospital, Clendinnen left on a tour abroad. This was spent mainly at the Mayo Clinic, where Russell Carman was then rising to the height of his great ability, particularly in gastro-intestinal diagnosis. This was a most important period in diagnostic radiology. Clinicians, no less enthusiastically than radiologists, were beginning to sponsor the X-ray investigational method with increasing confidence, for the Potter-Bucky diaphragm, the interrupterless transformer, the Coolidge tube and the duplitized film had made their appearances and were removing many of the uncertainties inescapable from the gas tube, induction coil and X-ray glass plate.

An indication of increasing specialization in radiology was given by Clendinnen's appointment as the first radiotherapist to the Melbourne Hospital, and he continued in this position until the completion of his term in 1933; he was then
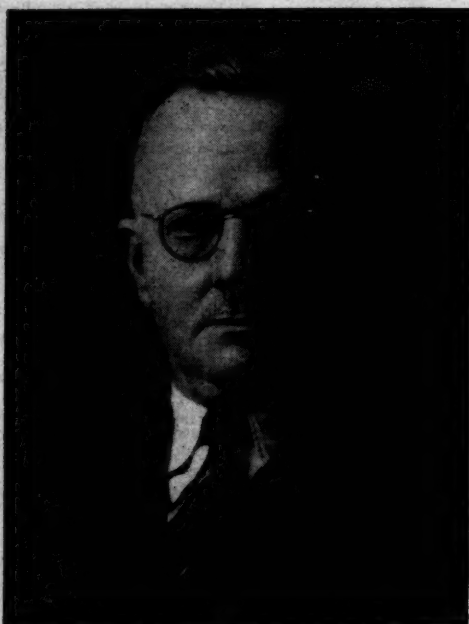
appointed to a similar position at Prince Henry's Hospital, and held this post until he had again completed a full term in 1953. He was elected a Fellow of the Faculty of Radiologists (London) in 1938.

In 1934 he had attended the British Medical Association meeting at Bournemouth and thence had gone to Stockholm, where he was much impressed by the needle technique of Heyman at the *Radiumhemmet*. It can be said that L. J. Clendinnen pioneered in Australia the interstitial use of radium needles in the treatment of individual malignant glands; the present-day treatment with its irradiation of the whole gland field was to come later. He made little contribution to radiological literature and was not a facile expositor in the written or spoken word.

Clendinnen had first-hand experience of the medico-legal hazards of radiology and had been for twenty-two years an assiduous member of the council of the Medical Defence Society of Victoria.

With many interests outside radiology, he was an expert gardener, and at his country home, "Burrowye", at Kallista in the Dandenongs, had developed a greatly admired garden, specializing in hydrangeas, rhododendrons, azaleas and camellias; he is said to have been the first in Victoria to have raised a camellia from a cutting. So keen was he that for several years one half-day weekly was spent in horticultural study at the Melbourne Botanical Gardens. Many of his friends owe some of their most prized plants to his

skill and generosity. He was furthermore a keen aviarist specializing in our native birds, particularly budgerigars and other Australian parrots. The interest in ornithology and other branches of natural history was recognized by his appointment twenty years ago as a trustee of the Wilson's Promontory National Park and later of the Sir Colin MacKenzie Sanctuary at Healesville, which was begun in the 1920's as a country station for anatomical research on Australian fauna, particularly the wombat, native bear, echidna and platypus; at that time it was an adjunct to the Australian Institute of Anatomy, first situated at Colin MacKenzie's home in St. Kilda Road, Melbourne, before its transfer to Canberra.

Clendinnen for over thirty years was a member of the Rotary Club, Melbourne. Nominated by the late Alan Newton, he was inducted in 1921, being one of the first two members to join the club after it had been chartered. He served on many of its committees and was one of the most regular attenders. For almost the same long period he was a member of the Athenæum Club, situated only a few doors eastward of the professional rooms which father and son had occupied for over fifty years. During the last decade of his life the Boy Scout movement attracted his interest.

The name of Clendinnen—father and son—should not be forgotten in Australian medicine, for both worked ably and conscientiously towards the sound advancement of diagnostic and therapeutic radiology during the formative years, difficult and uncertain as they were, of these two specialities.

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Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Annual Subscription Course.
Official Overseas Lecturer for 1954.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that E. B. Astwood, M.D., Ph.D., B.Sc., Research Professor of Medicine at the Tufts Medical School at the New England Centre Hospital, Boston, Massachusetts, will be visiting Sydney from July 3 to 17, 1954, as the committee's official overseas lecturer for 1954. His programme will include the following sessions: Tuesday, July 6, 8.15 p.m., "Medical Treatment of Thyroid Diseases", Stawell Hall, 145 Macquarie Street, Sydney. Wednesday, July 7, 11.45 a.m., presentation of cases in the Maitland Lecture Theatre, Sydney Hospital. Friday, July 9, 1.15 p.m., seminar, "Some Recent Developments in Thyroid Physiology", Scot Skirving Lecture Theatre, Royal Prince Alfred Hospital. Wednesday, July 14, 8.15 p.m., "The False Facets of Endocrinology", Stawell Hall, 145 Macquarie Street, Sydney. Friday, July 16, 1.15 p.m., seminar, "Pituitary Hormones", Scot Skirving Lecture Theatre, Royal Prince Alfred Hospital.

Dr. E. B. Astwood is a clinician who is as much at home in the laboratory as in the ward. He has made basic contributions to a better understanding of the endocrine glands and in particular of the functions of the mammary gland, pituitary, adrenal, thyroid, ovary and placenta. He has been one of the leaders in ACTH research, and his experimental studies on thyroxine led to the appreciation of the potential value of the thiourea compounds, the successful control of hypertension and a new approach to endocrinological research. He recently received the Borden Award for "his masterly adaptation of multiple scientific disciplines in the solution of clinical problems and the benefit of mankind". Dr. Astwood is visiting Australia at the invitation of the Australian Post-Graduate Federation in Medicine.

Course of Lectures on "The Scientific Basis of Medical Practice".

The following course of lectures, to be held at 8.15 p.m. in the Stawell Hall, 145 Macquarie Street, Sydney, has been specially arranged for members of the annual subscription course: Tuesday, July 27, "The Modern Clinical Trial", Professor R. H. Thorp, Professor of Pharmacology in the University of Sydney. Tuesday, August 3, "Recent Advances in Endocrinology", Professor C. W. Emmens, Professor of Veterinary Physiology in the University of Sydney. Wednesday, August 11, "The Pathogenesis of Generalized Viral Infections", Professor Frank Fenner, Professor of Microbiology in the Australian National University, Canberra. Tuesday, August 17, "Synaptic and Neuromuscular Transmission", Dr. Peter Bishop, Reader in Physiology in the

University of Sydney. Tuesday, August 24, "Porphyrins in Health and Disease", Dr. R. Lemberg, Assistant Director of the Institute of Medical Research, The Royal North Shore Hospital of Sydney. Thursday, September 2, "Trends in Virus Research", Professor P. M. de Burgh, Bosch Professor of Bacteriology in the University of Sydney.

General Information.

The annual subscription course covers attendance at lectures by overseas visiting lecturers and other specially arranged activities. The annual fee is £2 2s. from July 1. The fee for resident medical officers is £1 1s. A printed diary card is issued to members at regular intervals setting out detailed arrangements. Further inquiries may be made from the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney. Telephones: BW 7483, BU 5238. Telegraphic address: "Postgrad Sydney."

Medical Prizes.

THE STAWELL PRIZE, 1954.

THE Stawell Prize, a memorial to Sir Richard Stawell, is open for competition. The amount of the prize is £30 (thirty pounds).

The conditions are as follows:

1. The prize shall be awarded to the writer of the essay adjudged to be the best on a subject selected annually.

2. The subject for 1954 is "The Development of Modern Psychiatry in Relation to Medicine and Surgery".

3. The dissertation should be based on personal observation and experience of the writer.

4. The competition is open to graduates of any Australian university.

5. The trustees reserve the right to withhold the award.

6. Essays must be delivered to the Medical Secretary, British Medical Association (Victorian Branch), by 4 p.m. on March 31, 1955.

7. Each essay must be typewritten or printed and must not exceed 75,000 words in length.

8. Each essay must be distinguished by a motto and must be accompanied by a sealed envelope marked by the same motto, containing the name and address of the author.

9. The trustees reserve the right to publish the prize essay.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

THE following have been registered, pursuant to the provisions of the *Medical Practitioners Act, 1938-1950*, as duly qualified medical practitioners: Briscoe, Mary, M.B., B.S., 1954 (Univ. Sydney); Lennon, Evan Austin, M.B., B.S., 1949 (Univ. Queensland); Smith, Herbert Saviour, M.B., Ch.B., 1952 (Univ. Bristol).

The following additional qualifications have been registered: Hobson, David Lennox (M.B., B.S., 1943, Univ. Sydney): M.R.A.C.P., 1953; Indyk, Jack Solomon (M.B., B.S., 1945, Univ. Sydney, F.R.C.S. (England), 1951): F.R.A.C.S., 1953; Mishkel, Maurice Alan (M.B., B.S., 1954, Univ. Sydney): B.Sc. (Med.), 1952 (Univ. Sydney); Scott-Young, Margery (M.B., B.S., 1936, M.S., 1947, Univ. Sydney): F.R.C.S. (England), 1953, F.R.A.C.S., 1953; Hardcastle, Edgar John Buckle (M.B., B.S., 1940, Univ. Sydney): M.C.R.A., 1951; Kenny, Rawdon Hamilton (M.B., B.S., 1928, M.S., 1941, Univ. Sydney): D.D.R., 1953 (Univ. Sydney).

QUEENSLAND.

THE following have been registered, pursuant to the provisions of *The Medical Acts, 1939-1948*, as duly qualified medical practitioners: Haddan, Frank Ellison, M.B., B.S., 1952 (Univ. Sydney); Dawson, Leonard William George, M.B., B.S., 1953 (Univ. Sydney); Hosking, Hedley Anthony, M.R.C.S. (England), L.R.C.P. (London), 1952.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED MAY 22, 1954.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	3(1)	6(6)	1	..	4(4)	..	..	..	14
Amoebiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	..	..	..	..	1	..	1
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	1	1	..	..	..	..	..	2
Cholera	..	..	..	..	1(1)	..	..	..	1
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	3(1)	19(17)	..	..	..	..	1	..	23
Diphtheria	9(5)	3(3)	3(1)	..	6(4)	..	..	..	21
Dysentery (Bacillary)	..	4(4)	2(1)	..	3	..	..	..	9
Encephalitis	2(1)	..	..	..	..	..	..	..	2
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	10(4)	6(4)	..	..	2(2)	..	..	..	18
Lead Poisoning	..	3(3)	1(1)	..	..	..	..	..	4
Leprosy	..	..	..	..	..	..	..	..	..
Leptospirosis	..	..	2	..	..	..	..	..	2
Malaria	..	1	..	..	..	..	..	..	1
Meningococcal Infection	2(2)	2	1(1)	1(1)	..	1	..	..	7
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	14(5)	12(7)	2(2)	11(9)	10(7)	..	..	..	49
Puerperal Fever	..	..	..	..	..	..	..	..	..
Rubella	..	4(4)	..	..	..	..	..	..	4
Salmonella Infection	..	..	..	..	1(1)	..	..	..	1
Scarlet Fever	11(6)	24(16)	3	1	1(1)	1	..	..	41
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	..	..
Trachoma	..	..	..	..	10	..	..	..	10
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	46(41)	1	8(2)	6(5)	8(5)	3	3	..	75
Typhoid Fever	..	..	..	..	1(1)	..	..	..	1
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

The following additional qualifications have been registered: Toakley, James Geoffrey, F.R.C.S. (England), 1952; Lane, Daniel Gerard, F.R.C.S. (Edinburgh), 1951, F.R.C.S. (England), 1952; Tuffley, Donald James, F.R.C.S. (England), 1952.

TASMANIA.

DR. CLIFFORD CRAIG has been appointed President of the Medical Council of Tasmania and Dr. James Scott Reid has been appointed a member of the Council *vice* Dr. W. E. L. Crowther, resigned.

The following have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners: Wilson, Margaret, M.B., B.S., 1945 (Univ. Glasgow), D.C.H. (London), 1949; Davenport, Valerie Alison, M.B., B.S., 1952 (Univ. Melbourne).

The following additional qualification has been registered: McArthur, Andrew McShee, D.T.M. and H., Sydney.

Notice.

BRITISH MEDICAL ASSOCIATION, VICTORIAN BRANCH.

A MEETING of the Section of Industrial Medicine of the Victorian Branch of the British Medical Association will be held in the Medical Society Hall, 426 Albert Street, East Melbourne, on Tuesday, June 22, 1954, at 8 p.m. A paper will be delivered by Dr. Leigh Wedlick entitled "The Use and Abuse of Physical Medicine in Industrial Injury Cases". Discussion will be opened by the President of the Section, Dr. J. H. Gowland. All members of the Branch are invited.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Nesztel, Paul John David, M.B., B.S., 1953 (Univ. Sydney), 28 Boomerang Street, Haberfield, New South Wales.

Caska, Zdenko Josef, provisionally registered in accordance with the provisions of Section 17 (1) (c) of the *Medical Practitioners Act*, 1938-1953, 79 Wolseley Street, Guildford, New South Wales.

Ambroza, Sophie, provisionally registered in accordance with the provisions of Section 17 (1) (c) of the *Medical Practitioners Act*, 1938-1953, 29 Elsmere Street, Kensington, New South Wales.

Medical Appointments.

Dr. H. M. Fisher has been appointed a representative of the Queen Victoria Maternity Hospital Association on the board of the Queen Victoria Maternity Hospital, Launceston, Tasmania.

Dr. J. D. Murphy has been appointed Deputy Medical Superintendent of State Hospitals and Homes in the Department of Public Health, New South Wales.

Dr. R. F. Matthews has been appointed an official visitor to the Mental Hospital, Orange, New South Wales.

Dr. T. B. Winckle has been appointed a public vaccinator of the Borough of Queenscliffe, Victoria.

Dr. M. S. Marshall has been appointed government medical officer at Millmerran, Queensland.

Sir Victor Hurley has been appointed to be a trustee of the land permanently reserved on March 14, 1882, as a site for a hall and library for the use of the Medical Society of Victoria and for other scientific purposes at East Melbourne.

Dr. H. McLorinan has been appointed a member of the Commission of Public Health, Victoria, pursuant to the provisions of Section 8 of the *Health Act*, 1928, of Victoria.

Dr. D. A. Cameron has been appointed a trustee of the Boys' Grammar School, Ipswich, Queensland.

Dr. Margaret Helen Nicol has been appointed a public vaccinator to the City of Melbourne.

Dr. D. N. Hewson has been appointed a public vaccinator to the City of South Melbourne.

Dr. Henry Erskine Downes has been appointed Acting Director-General of Health and Acting Director of Quarantine from April 16, 1954, for a period of three months or until the return of the Permanent Head from duty abroad.

Dr. Allan Leslie Greenaway has been appointed as a quarantine officer at Fremantle, Western Australia, under the provisions of the *Quarantine Act*, 1908-1950.

Dr. D. McL. Somerville has been appointed superintendent of the Reception House, Darlinghurst, New South Wales.

Dr. P. R. Hodge and Dr. H. Lander have been appointed honorary clinical assistants in pathology to the Royal Adelaide Hospital.

Diary for the Month.

JUNE 14.—Victorian Branch, B.M.A.: Finance Subcommittee.
JUNE 15.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JUNE 16.—Western Australian Branch, B.M.A.: General Meeting.
JUNE 16.—Victorian Branch, B.M.A.: Clinical Meeting.
JUNE 17.—Victorian Branch, B.M.A.: Executive of Branch Council.
JUNE 17.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 17.—South Australian Branch, B.M.A.: Scientific Meeting.
JUNE 22.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Tasmania: Part-time specialist appointments for the north-west coast of Tasmania.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognise any claim arising out of non-receipt of journals unless such notification is received within one month.

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